PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Vol. 109, No. 10 Thursday, September 7, 1939 Price Ten Cents

# Pledge Newsprint Supply During the War

## Canadian Mills Will Make Every Effort To Maintain Stabilized Conditions In Situation Which Now Exists Because of the Conflict In Europe —Will Avoid Any Attempt To Profiteer Or Cause Disorderly Markets.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 5, 1939—Canadian newsprint manufacturers "will make every possible effort to maintain stabilized conditions of continuous supply" in the situation which now exists because of the war in Europe, Charles Vining, president of the Newsprint Association of Canada, said today.

The manufacturers "realize their duty and responsibility in supplying a commodity of vital wartime importance in the dissemination of news and public information, and they wish to give assurance that this realization will guide their conduct," his statement said.

"They pledge themselves to assist, by any means within their power, the war effort of the nation.

"The Canadian newsprint manufacturers will meet the wishes of their government by avoiding any attempt to profiteer and will make every possible effort to maintain stabilized conditions of continuous supply and to discourage methods of buying and selling which might cause a disorderly market.

"With these purposes in mind, the Canadian manufacturers strongly urge their customers to take their shipments as far as possible in equal monthly quantities.

"If normal contract methods of buying are followed, the Canadian mills believe they are in position to assure continuous adequate supply to all customers depending on them."

## Smith Paper Co. Orders Machine

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., Sept. 5, 1939—Announcement is made by the Bagley & Sewall Company of the receipt of a large order from the Smith Paper Company, Inc., Lee, Mass., for a paper machine of 120-inch width. A statement by the management revealed that the concern was forced to take the contract at a small margin of profit because of being pitted against Belgian and foreign competition. The contract is understood to amount to between $110,000 and $115,000 and will keep the plant running and all hands employed until about the first of the coming year. Work will be started on the machine in about two weeks. In the meantime the company will finish the rebuilding of an exceptionally fine calender stack upon which work has been progressing for the past several weeks. Besides this order the company is also now finishing the rebuilding of a machine for the Acme Paper Box Company, Ltd., of Toronto, Ont.

The machine for the Smith Paper Company will be 140 to 150 feet in length, designed for cigarette and other lightweight papers, with a maximum speed of 540 feet per minute. It will run from 125 to 250 feet per minute on cigarette paper, slow production being required on this grade. A number of cigarette manufacturing companies are supplied with paper by the Smith concern which already has an installation of ten paper machines in its mill. The Bagley & Sewall Company is making a strong bid for more paper machine repair and rebuilding work and orders for this class of employment and the new machine contracts are expected to keep the plant in operation about four months. At the same time the company is rebuilding five milling machines in its own vise department preparatory to storing up about twenty-five sizes of vises on its storeroom shelves. The concern built another paper machin for the Smith Paper Company a few years ago which is understood to have received considerable praise.

## Eastern Corp. Personnel Changes

Robert C. Clark, assistant to the president of Eastern Corporation, Bangor, Maine, has been elected vice-president, and placed in charge of general sales. Ralph E. Will, assistant advertising manager, has been appointed advertising manager, and Harry H. Morrison, mill office manager, will be manager of the order department.

Roland S. Collins and Harold R. Knott have been appointed assistant sales managers, under Mr. Clark. Mr. Collins will be in charge of the New York Sales Office, which will be maintained at 500 Fifth avenue. The company's sales office in Chicago will be retained in the Conway Building in charge of Mr. Knott. While it is expected that regular customer service will be substantially improved by moving general sales and advertising headquarters from New York City to Bangor, the New York and Chicago Offices are designed and will be operated for maximum customer service.

# Rhinelander Constructing Addition to Mill

## Work On Building Under Way At Rhinelander Paper Mill To Provide Needed Space—Mills Back Bill To Relieve Water Shortage — Huge Reforestation Plan Proposed—Paper Institute Chemistry Forming Class.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 5, 1939—Construction work is well under way on the addition to the mill of the Rhinelander Paper Company, Rhinelander, Wis. It is being constructed to meet the need for expanded laboratory facilities to keep up with developments in the Glassine field, also to provide more finishing space by utilizing the present mill office space.

The new building will be 48 by 94 feet in size, two stories, and of brick, steel and concrete construction. It will contain the library, laboratory director's office, main laboratory, two research laboratories and a humidity controlled testing station.

C. R. Meyer & Sons Company, Oshkosh, Wis., has the contract.

### Mills Fight For Bill to Relieve Water Shortage

An unrelenting fight is being waged to salvage the charter bill in the Wisconsin Legislature permitting construction of a storage reservoir at Lily, Wis., as a means of remedying the water shortage conditions among paper mills of the Fox River Valley. The bill's progress was stopped by an amendment introduced by Assemblyman Mark Catlin, Jr. of Appleton, Wis., specifying the reservoir must be built on a more expensive site at Leeman, Wis. The amendment was adopted.

Since then, a legislative committee held a meeting at Appleton and made a tour of inspection of the affected area and the proposed sites. At this hearing, Charles R. Seaborne of the Thilmany Pulp and Paper Company, Kaukauna, Wis., testified that his firm is wholeheartedly backing the reservoir project, and is willing to assist in the financing because it is convinced that it is feasible economically and from an engineering point of view.

### Thilmany Pulp Mill Forced to Close

Mr. Seaborne said his company was forced to close its pulp plant ten days ago, buy pulp from Sweden, shut down two paper machines and dismiss workers because of the condition and quantity of water in the Fox River. He said there are orders on file that cannot be filled because of the condition of the water, and that previous orders had been rejected because of unsatisfactory quality, again caused by the water.

Flowage from the reservoir would be equal to 25 per cent of the flow of the Wolf River, tributary to the Fox, Mr. Seaborne added, and would mean the difference between scum and clean water in the Fox River. Water conditions were pointed out to be worse than for the last 21 years.

Mayors of Fox River Valley cities, labor union representatives and riparian land owners who have been menaced by spring floods also appeared at the hearing. The matter is again before the Legislature this week, with hope of reconsidering the amendment and authorizing construction of the reservoir at Lily instead of Leeman.

Letters signed by all of the mayors have also been placed in the hands of all legislators pointing out that the reservoir would hold over four billion cubic feet of water, obtained during flood periods. There would be no expense to the state, since the project would be financed privately and water power users would be assessed tolls according to the benefits enjoyed. The amount of stored water, it is pointed out, would be equal to six inches on Lake Winnebago, from which water is released to the Fox River by means of a control dam. If the reservoir were now filled, the letter adds, it would add 50 per cent to the flow of the river for about ten weeks.

### Huge Reforestation Plan Proposed in Bill

Inauguration of a gigantic reforestation effort in Northern Wisconsin is proposed in a bill introduced in the Wisconsin Legislature by Assemblyman Henry J. Berquist of Rhinelander, Wis. It would abolish the present activities in that section of the WPA, CCC, NYA and FSA and create a department of forestry in the executive department of the government. All state agencies engaged in reforestation would be consolidated under the direction of this one department.

Such a program would provide a long range program to restore pulp wood species to the cutover lands, and in time assure a constant supply to mills now compelled to ship raw materials from Canada. Selective cutting would perpetuate the supply, it is pointed out.

### To Hold Hearing on Shipping Contracts

Of interest to large shippers is a hearing scheduled by the United States Maritime Commission in Washington, D. C. September 13 on the validity of contracts between shippers and the North Atlantic Steamship Conference.

Contracts between the shippers and the Conference provide that all goods handled by shippers must be routed through Atlantic ports. Wisconsin cities contend this unfairly diverts many cargoes that should be shipped direct from the Great Lakes to Europe. One commissioner has held the contracts are in restraint of trade.

### Paper Chemistry Students Hail From 13 States

Thirteen states will be represented in the first-year class at the Institute of Paper Chemistry, Appleton, Wis. Registration takes place September 21, after the students completed a field course in wood technology in Michigan forests.

Following are the new students, the colleges from which they come, and their home addresses: Daniel O. Adams, Oberlin College, Portland, Me.; Archie J. Deutschman, Jr., University of Illinois, Chicago; Paul B. Hansen, Washington State College, Yakima, Wash.; James J. Harrison, Montana State College, Conrad, Mont.; John M. Jernigan, University of Alabama, Brundige, Ala.; Edwin J. Loutzenheizer, Ar-

mour Institute of Technology, Gothenburg, Nebr.; George D. Knight, Alabama Polytechnic Institute, Selma, Ala.; John M. McEwan, Ohio State University, Bremen, Ohio; George L. Montross, Grinnell College, Winterset, Iowa.

Jules P. Perot, Centenary College of Louisiana, Shreveport, La.; Frederick B. Schelhorn, University of Pennsylvania, Glenside, Pa.; Philip E. Schick, Harvard University, Van Vert, Ohio; John G. Turk, University of Texas, Hillsboro, Tex.; Robert J. Van Nostrand, Lawrence College, Wauwatosa, Wis., and Albert P. Yundt, Georgia School of Technology, Atlanta, Ga.

### Power Company Want to Refund Stock

Wisconsin Michigan Power Company, serving the Fox River Valley paper mill area, has filed an application with the Wisconsin Public Service commission at Madison, Wis., for authority to refund its outstanding 6 per cent preferred stock and sell a new $4,000,000 issue of 4½ per cent preferred.

In addition, the utility proposes to issue and sell 2½ per cent unsecured promissory notes in the amount of $810,000 to provide other funds necessary for the retirement of the 6 per cent preferred and a 3 per cent installment note amounting to $560,000.

The action enables the utility, it is pointed out, to take advantage of the present market conditions favorable to refunding.

In addition to the preferred stock and the installment note, the utility has outstanding $12,500,000 in 3¾ per cent first mortgage bonds due in 1961, and 261,250 shares of $20 par value common stock.

The application showed net income for six months ending June 30 was $377,291. In the full year of 1938, net income was $735,507. Total assets are $28,251,204.

### Nicolet Employees Hold Annual Picnic

Employees of the Nicolet Paper Company, West De Pere, Wis., held their annual picnic Sunday, September 3. Numerous contests were conducted for cash prizes, there were many events for children, and the event closed with dancing.

### Sensenbrenner Appointed to Regents Board

F. J. Sensenbrenner, president of Kimberly-Clark Corporation, Neenah, Wis., has been appointed by Gov. Julius P. Heil as a member of the board of regents of the University of Wisconsin. The board is being newly organized with a membership of nine to replace the former board, abolished by legislative action. Mr. Sensenbrenner drew the longest term, nine years.

### Winners in Kimberly-Clark Golf Contests

Champions in the four flights of the annual Kimberly-Clark Corporation golf tournament at Ridgeway Golf Club, Neenah, Wis., have been announced by John Farmakes, who was in charge of play.

Robert Stark won the championship in the first flight and the F. J. Sensenbrenner trophy, defeating John Hilton, Marty Killoren and Herbert Stinski in the first three rounds, and William Fieweger in the finals.

Defeating Roland Marmes in the finals, Casey Jons won the championship in the second flight, winning the Ernst Mahler trophy, and eliminating Rudolph Lofgren, James Shipman and Arthur Schwertfeger.

George Klock won the third flight and the S. F. Shattuck trophy, defeating George Henebry in the finals, having won from Wesley Cook, James Mackey and Harold Hammen.

The Harry Price cup was won by George Henebry, who defeated George Klock in the finals, and C. B. Allen, Leonard Meyer and Howard Crabb on the way up.

### Estate of Mrs. G. W. Mead Valued at $525,000

Mrs. George W. Mead, wife of the president of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., who died two weeks ago, left an estate of approximately $525,000. Mr. Mead is the beneficiary of the estate.

## Northwest Superintendents To Meet

The fall meeting of the Northwest Division of the American Pulp and Paper Mill Superintendents Association will meet at the Hotel Wausau, Wausau, Wis., September 8-9. The pre-convention meeting will be held at the Elks Club on September 7.

The convention opens with a general meeting on September 8 at 10 A.M., at which the following subjects will be presented. "New Advances in mining, storing and transportation of coal," by G. E. Wattles, of Northland Fuels, Inc., Marinette, Wis., and "Discussion on Various Types of Paper Mill Insurance," by J. E. Hoff, of the T. E. Brennan Company, insurance consultants, Milwaukee, Wis.

Following luncheon, a golf tournament will open, with an afternoon of bridge for the ladies. Visits to the following mills are scheduled: Mosinee Paper Mills, Mosinee, Wis.; Marathon Paper Mills Company, Rothschild, Wis.; Wausau Paper Mills Company, Brokaw, Wis.; and Ward Paper Company, Merrill, Wis.

The day will close with a dinner dance at the Wausau Club with music by Earl Kemp's band.

The program for Saturday, September 8, will open with a general meeting at 10 A.M., with E. W. Peterson, division chairman, presiding. The subjects to be presented will be, "The use of vortraps in paper and pulp mills," by F. B. Schilling, of Nichols Engineering and Research Corporation, New York, and "The Howard Sulphite waste liquor recovery process," by Guy C. Howard, of the Marathon Paper Mills Company, Rothschild, Wis.

A joint luncheon will follow at the Hotel Wausau at which time the golf and bridge prizes, donated by the chlorine industry and manufacturers of chemicals for the pulp and paper industry, will be presented.

## Baker Paper Co. Leases Building

ST. LOUIS, Mo., September 5, 1939—The Baker Paper Co. has concluded negotiations for a long-term lease on a two-story and basement building located at 2021 Delmar boulevard, owned by the Dozier estate.

This building, comprising 22,000 square feet, has a heating plant, sprinkler and an electric elevator. Alterations are now being made to meet the requirements of the purchaser.

The Baker company, of which Roscoe G. Baker is president, is now located at 606 South Seventh street.

# Toronto Expecting Business to Improve

## European Conflict Introduces Element of Uncertainty But Dealer Stocks Are Reported Very Low and Improved Business Activity Is Likely This Fall—New Abitibi Reorganization Plan Suggested — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 4, 1939—The past two months have been seasonably quiet in the paper trade in Toronto with the trade expecting that a change for the better will be ushered in during September. The Canadian National Exhibition, which is now in progress and is attended annually by a million and a half people, resulted in a temporary perking up of orders and printers, who have been slack for some time, report activity. Stocks with most consumers are very low and all buying has been from hand to mouth. Fine papers, covers, tissue, cover stock and board remain the same in price. The first few months in 1939 with the mills and jobbers has not been equal to the turnover during the corresponding period of 1938 but equals in volume and value the first few months of 1937. When various disturbing factors have disappeared, the Toronto trade is certain that the last half of 1939 will be better than the first half. There is abundant confidence and, fundamentally, things are sound but momentum and confidence have been lacking.

### W. J. Zimmerman Located in Toronto

W. J. Zimmerman, who has been appointed chief engineer for the Abitibi Power & Paper Company, is now located at the head office of the company in Toronto. For several years he was engaged with the Mead Corporation and designed and built several mills for that concern. He has done quite a lot of engineering work in Canada. Mr. Zimmerman was for some time with the Minnesota and Ontario Paper Company and has had a wide and successful experience.

### Thomas Butler Heads Ontario Unions

Thomas Butler of Port Arthur, Ont., was re-elected president of the Northern Ontario District Council of Pulp and Paper Mill Unions, which held its second annual convention last week at Dryden, Ont. Albert Nicklin, of Port Arthur, and David McKeever, of Fort Frances, are vice presidents and H. G. Grattan, of Port Arthur, was re-elected secretary-treasurer. The convention next year will meet at Fort Frances. Resolutions were carried which will be presented to the provincial and federal governments regarding renewed efforts on reforestation and conservation. The Council was formed some months ago by the International Paper Makers Union and the International Union of Pulp and Sulphite Workers Union to promote better working conditions for employees and to assist the industry wherever possible. International officers present included Arthur D'Aoust, of Quebec City, fourth vice president of the International Brotherhood of Paper Makers, and B. Smith, of Port Arthur, representing the international offices of the Steel and Operating Engineers. Mr. D'Aoust and Mr. Smith delivered interesting and instructive addresses on International Union affairs, and there was an attendance of fifty-eight delegates representing unions from Iroquois Falls, Sault Ste. Marie, Port Arthur, Fort William, Fort Frances, Kenora and Dryden, Ontario, and from Pine Falls, Manitoba. The proceedings were brought to a close by an enjoyable banquet when speeches were made by A. G. Pounsford, manager of Provincial Paper, Limited, Port Arthur, R. J. Askin, representing the technical section of the Pulp and Paper Institute, J. S. Wilson, vice president and general manager of the Dryden Paper Company and others.

### Carruthers Made Assistant Sales Manager

G. L. Carruthers, of Toronto, has been appointed assistant general manager of the Interlake Tissue Mills Company, Thorold, Ont. For the past ten years he has been with the organization and will continue to act in the capacity of sales manager. He is son of George Carruthers, president of the company who is a former President of the Canadian Pulp and Paper Association and also a former President of the Ontario Pulp and Paper Makers' Safety Association.

### Abitibi Reorganization Plan Approved by Many

Many letters and telegrams have been received endorsing the Bradshaw plan for the reorganization of the Abitibi Power and Paper Company, Limited. Favorable expressions of opinion have been arriving from Montreal, New York and other centers. Included among those who are offering cooperation are some bondholders whose bonds are pledged behind the Bondholders Protective Committee plan for judicial sale of the assets. The committee has not yet met to consider its attitude officially to the offer of an independent committee to mediate but it is said that disinclination to foreclosure is gathering volume. For some members of the committee the desire for action was never very strong and the plan was agreed to reluctantly on the advice that agreement under the Dominion Companies Act and the Companies Creditors Arrangement Act would be difficult to obtain. Sir Henry L. Drayton, chairman of the Bondholders Defensive Committee, has written the committee of Hon. Howard Ferguson, Thomas Bradshaw and Hon. Gordon W. Scott that the Bondholders Defensive Committee has considered the suggestions and approves of the plan as outlined. The committee believes that the plan should meet with the approval of bondholders inasmuch as it apparently fully preserves their senior position.

### Interlake Tissue To Erect New Addition

Interlake Tissue Mills Company, Thorold, are making extensions to their plant. The new building will cover an area of forty by sixty feet and will give increased office accommodation and storage facilities. General mill supplies will be housed in the basement. The Interlake Tissue Mills Company are making their usual artistic and varied display at the Canadian National Exhibition in Toronto where they have had a prominent booth for many years. The exhibit of the company this year is much admired.

# Financial News of Pulp and Paper Industry

## United Paperboard Reports Net Loss— Increased Net Sales For United Wall Paper Factories — William Race Elected Secretary of Sutherland Paper Company—Income of Schumacher Wall Board Corporation Rises.

**New York Stock Exchange**

High, Low and Last for the Week Ending September 6, 1939

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | 2⅜ | 1¾ | 2¼ |
| Armstrong Cork Co. | 38½ | 32 | 33 |
| Celotex Corp. | 10¼ | 8½ | 9⅜ |
| Certain-Teed Products Corp. | 6⅜ | 5¼ | 5⅞ |
| Certain-Teed Products Corp. pf. | 26 | 22 | 24¾ |
| Champion Paper & Fibre Co. | 21½ | 17 | 21 |
| Congoleum-Nairn Co. | 23¼ | 20 | 20½ |
| Container Corp. of America | 13 | 9¼ | 12⅜ |
| Continental-Diamond Fibre Co. | 7¼ | 5¼ | 7⅛ |
| Crown-Zellerbach Co. | 13⅞ | 9⅛ | 13½ |
| Crown-Zellerbach Co., pf. | 78 | 78 | 78 |
| Flintkote Co. | 17½ | 15 | 16⅜ |
| Robert Gair | 3¼ | 2 | 3 |
| Robert Gair, pf. | 9½ | 8 | 9½ |
| International Paper & Power | 10⅛ | 6½ | 9½ |
| International Paper & Power, pf. | 36⅜ | 25½ | 33¾ |
| Johns-Manville Corp. | 65½ | 59 | 64 |
| Johns-Manville Corp., pf. | 122 | 122 | 122 |
| Kimberly Clark Corp. | 29½ | 26⅜ | 29 |
| MacAndrews & Forbes | 32½ | 32 | 32½ |
| Masonite Corp. | 39 | 30 | 33½ |
| Mead Corp. | 10 | 6 | 9½ |
| Mead Corp., pf. | 63 | 62⅛ | 63 |
| Paraffine Companies, Inc. | 39 | 38⅞ | 39 |
| Ruberoid Co. | 18¼ | 15⅜ | 18 |
| Scott Paper Co. | 48½ | 44¾ | 45 |
| Scott Paper Co., pf. | 106 | 106 | 106 |
| Sutherland Paper Co. | 24¼ | 22¾ | 24¼ |
| Union Bag & Paper Corp. | 9 | 6 | 8 |
| United Paperboard Co. | 5¾ | 3¾ | 5¼ |
| U. S. Gypsum Co. | 81 | 70½ | 71 |
| U. S. Gypsum Co., pf. | 168¼ | 165 | 165 |

**New York Curb Exchange**

High, Low and Last for the Week Ending September 6, 1939

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 5¾ | 5 | 5¾ |
| Brown Co., pf. | 16 | 10½ | 15 |
| Great Northern Paper | 36¾ | 36¾ | 36¾ |
| St. Regis Paper Co. | 2⅞ | 1⅜ | 2⅜ |
| St. Regis Paper Co., pf. | 51 | 40 | 51 |
| Taggart Corp. | 3⅜ | 2¾ | 3⅜ |

### United Paperboard Shows Loss

William S. Stuhr, president, in submitting to stockholders the financial report of the United Paperboard Company, Inc., for the year ending May 27, 1939 says, "For the fiscal year ending May 27, 1939, the company had a consolidated net loss of $15,069.09, after providing for depreciation and Federal Normal Income Taxes of $79,185.99. Through the purchase of 2,327 shares of the company's preferred stock on the open market at a cost of $58,856.98 less than par, the capital surplus account was increased by that amount. The capital and earned surplus at the end of the fiscal year was $282,326.29 compared with $230,634.39 for the prior year, with an increase in value for the common stock of 21½c per share. On May 27 total current assets were $1,774,364.57, total liabilities were $89,636.70 and excess of current assets over liabilities was $1,684.727.87.

"The past fiscal year was one of very low prices for paperboard. The recent increase in the productive capacity of the industry, concurrently with the business recession setting in, caused prices to go down to an unprofitable level. Although the company increased its sales in tons of board shipped by 8.75 per cent, the sales price received for this tonnage decreased 9.35 per cent in comparison with the prior fiscal year.

"During the past year the company continued its policy of modernizing its mills and to that end made many additions to its machinery and equipment in its mills at Thomson (N. Y.), Lockport (N. Y.) and Urbana (Ohio) under the supervision of an independent engineering firm. The management encountered production problems during the installation period because of the need for continuing operations of the mills to fill current orders while the new equipment was being installed, the need of adapting the personnel to the operation of the new system and delays in obtaining deliveries of equipment. As a result of the improvements installed, the company should be in a position during the current fiscal year to gain the benefits therefrom in the manufacture of better paperboard and an increase in production which should lower the cost per ton of board.

"Your management has increased its sales efforts for the territories served by the Lockport and Urbana Mills to enable these mills to operate on fuller schedules. The company has inaugurated a mail order business for cedar board and patented folding boxes and has distributed circulars to the trade. At the Urbana mill the company has recently opened a box factory which will make folding boxes from paperboard manufactured there.

"During the past fiscal year Jersey City (N. J.) instituted tax proceedings against the company for a substantial amount, based on the New Jersey personal property tax on intangibles. These proceedings were settled very favorably to the company through the cooperation of the Jersey City officials."

### United Wall Paper Loses $216,198

United Wall Paper Factories, Inc., for the year to June 30, report a net loss of $216,198, against net income of $137,885, in the previous year, equal, after preferred dividend requirements, to 8 cents each on 1,138,090 common shares. Losses in last year were attributed largely to extraordinary non-recurring expenses and liquidation of interest in an English wall paper company. Net sales for year increased to $5,297,132 from $4,929,747 in preceding year.

### William Race Is Made Secretary

William Race treasurer of the Sutherland Paper Company was elected secretary and a director at the monthly meeting of the board held August 21, 1939 at Kalamazoo, Mich. This action was taken following the death of Frederick W. Sutherland, who was Vice President and Secretary.

Mr. Race has been associated with the company for the last five years.

### Schumacher Nets $39,591

Schumacher Wall Board Corporation for the quarter to July 31, report a net income of $39,591, equal after preferred dividend requirements, to 38 cents each on 66,000 common shares, against $33,942 or 30 cents a common share in same quarter a year ago.

# TAPPI Convention To Be Big Success

That the TAPPI convention scheduled for September 11-14 at Syracuse bids fair to be one of the largest ever on the records of the industry, was predicted late this week by Carl F. Richter of Watertown, N. Y., aide to the general chairman of a committee acting for the Empire State Section which is sponsoring the conclave.

A top-notch technical program . . . brilliant speakers . . . spirited stag luncheons . . . tours both to mills and scenic points of beautiful upstate New York . . . a gay ladies' program for delegates' wives and sisters . . . skeet, golf and swimming . . . dancing to the lilt of Mal Hallett's swingsters . . . all these

JOHN H. RICH
Newton Falls Paper Co.
Chairman, Transportation Committee

and lots of other features will comprise the round of events at this great, gala convention. As a crowning social event, more than 1,000 guests are invited to attend a whaling big clambake on the cool, breezy shores of famous Oneida Lake. The Solvay Sales Company will be host at this affair.

The sponsoring Empire State Section, incidentally,

WILLIAM S. STUHR
President, United Paperboard Co.
Advisory Committee

provides in itself a point of interest. It is the most-recently chartered unit of the national association. The charter was granted April 2, 1938. Convention award to such a youthful group offers a challenge in itself; one that present indications predict will be carried off with honors.

Said Mr. Richter, "Every plan is in order; every detail complete. We're going to make it easy for delegates to have the time of their lives. Our technical program offers solid substance. If the combined result fails to hit the spot, then we never saw a convention!

"Advance information from members and suppliers indicates an overwhelming attendance. There'll be something doing every minute along the way."

An education in itself, Mr. Richter points out, will be the many industrial exhibits. There will be everything here to stir the heart of a pulp and paper man. Bookings, to date, take this department to the front in a big way.

Of interest to TAPPI members (and subsequent

DAVID F. LAWLESS
Treasurer, Lawless Brothers Paper Mills, Inc.
Advisory Committee

W. S. GAMBLE
President, Brownville Board Co.
Advisory Committee

headache to the house-engineers of Hotel Syracuse, headquarters of the convention) is the fact that certain exhibit-pieces comprise more bulk, complexity and weight than any other equipment ever placed on the exhibition floor of that hotel.

From a prim window on this big hotel, convention guests will see another unusual sight: Sticking through it will be an honest-to-goodness smoke stack; conduit for an exhibitor's "plant" that will run full-tilt in the lobby. Between smoke stacks, wild Indians, and the invading nation-wide clan of TAPPI, it begins to look as though the association will take the entire city by storm.

Toward the basic serious trend of the convention, however, Mr. Richter points out that the technical program is outstanding in its broad perspective. Speakers will represent a nationwide group of experts. Topics will be covered thoroughly.

Luncheon and dinner speakers, too, have been chosen with an eye toward quality. They will include Dr. Hugh P. Baker, president of Massachusetts State College, pioneer dean and co-founder of the New York State College of Forestry. The institution's present dean, Samuel N. Spring, will also be a guest of honor; as is also Frank W. Lovejoy, sales executive of the Socony-Vacuum Oil Company.

Yes, the convention is primed for momentum. When the opening day marks its starting-time, it will travel with the impetus of a limited express.

## Salesmanship to be Key Note

The executives of the National Paper Trade Association announce that sales management and salesmanship will be the dominant theme of the semi-annual convention to be held at the Stevens Hotel, Chicago, September 18-20. The general sessions and the meetings of both Fine and Wrapping Divisions of the organization will be especially devoted to this subject. Selling is the primary object of every paper merchant. Efficient and successful sales management is essential to the success of every business. The association executives have therefore prepared a program which will afford stimulation and new ideas and methods of sales promotion which will be helpful to the members and which can be adapted to their individual use.

Two outstanding speakers will appear on the program—Col. T. Russ Hill, of Rexair, Inc., Chicago, author of "The Gold Book for Salesmen," whose inspirational articles and messages are regularly read by thousands all over the country, and Ralph W. Carney, the famous manager of the Coleman Lamp and Stove Company, Wichita, who is sought as a speaker by business organizations everywhere.

The usual exhibit of wrapping paper lines, paper products, specialties and twine will be held in connection with the convention and the long list of representative manufacturers and convertors who have already reserved exhibit space is given below. The association's exhibit committee, through R. W. Miller, chairman, is especially recommending to the membership that they bring their salesmen to Chicago to make the rounds of the manufacturers' displays, pick up new ideas and hear the stimulating speakers who have been engaged.

The general sessions and the semi-annual meeting will of course be presided over by President F. T. Jamison, Interstate Cordage and Paper Company, Pittsburgh. Vice-President P. W. Lesh, Indianapolis, will conduct the sessions of the Fine Paper Division, and Vice-President C. E. Roach, Springfield, Ill., the Wrapping Paper Division. Reports will be made by several committees which have been working on trade problems since the February convention.

The list of exhibitors follows:

A. P. W. Paper Company, Allied Paper Bag Corporation, American Paper Goods Company, Bay West Paper Company, Better Packages, Inc., Brown Company, Central Paper Company (Menasha), Central Paper Company, Inc. (Muskegon), Cleveland Mill and Power Company, Container Corporation of America, Crossett Paper Mills, Crystal Tissue Company, Detroit Sulphite Pulp and Paper Company, Dixie-Vortex Company, Fort Howard Paper Company, John M. Hart Company, Inc., Hinde & Dauch Paper Company, Hoberg Paper Mills, Hooven & Allison Company, Hy-Sil Manufacturing Company, Lily-Tulip Cup Corporation, Loroco Industries, Inc., Midland Products, Inc., National Soda Straw Company, Nekoosa-Edwards Paper Company, Oneida Paper Products Inc., Orchard Paper Company, Pejepscot Paper Company, Racquette River Paper Company, Rexford Paper Company, Sealright Company, Inc., Self-Locking Carton Company, Sherman Paper Products Corporation, Soeg Paper Company, Sutherland Paper Company, Union Bag and Paper Corporation, Universal Paper Products Company, Victoria Paper Mills Company, Wolf Brothers.

## Tarentum Ship by Air Express

TARENTUM, Pa., September 5, 1939—"Enterprising and alert R. B. Livermore, general manager of the Tarentum Paper Mills, quick to see the convenience and advantages of this new speedy service, became the first local industrial head to ship his product the new way, and also the first to send out air express on Air Mail Route 1001 operated by All American Aviation, Inc,, according to the News-Item.

"To the Mid-States Gummed Paper Products Company of Chicago, goes the first air express from this community and the first on the state airline. The shipment, a roll of paper weighing 125 pounds, was to arrive last evening at 9:30 in the Windy City, making a connection with TWA plane at County Airport a few minutes after arrival of AAA plane at the Pittsburgh field.

"Thus, to the Tarentum Paper Mills goes the honor of the first shipment of air express from the local community and to the Chicago firm the honor of receiving the first consignment of express from Pennsylvania via the new pickup system."

## Hearing on Trade Agreement Oct. 2

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 23, 1939—The State Department has announced that hearings will be held on October 2 in connection with a new trade agreement between the United States and Belgium. An agreement is now in existence.

Among other commodities on which the hearings will be held are included uncoated papers, including wrapping paper, wholly or partly decorated on which the present duty into this country is 4½ cents per pound and 20 per cent ad valorem.

Also vegetable parchment paper "by whatever name known" on which the present duty from Belgium is 2 cents per pound plus 10 per cent ad valorem. And sensitized paper on which the present duty is 22½ per cent ad valorem.

## Potdevin Long-Range Bag Machine

A large long-range bag machine has just been added by Potdevin Machine Company to their well-known "Century Line". This Potdevin Model 105 is the largest of the set. It makes flat and square grocery, notion, millinery, laundry and large specialty bags. Flat bag sizes produced range from 3⅞ x 8¼ inches up to 21 x 29½ inches. Like the other "Century Line" machines, this unit is equipped with a vertical tapeless delivery which greatly simplifies the handling of the finished bags.

NEW POTDEVIN BAG MACHINE

Several other features make operation easier and quicker. The construction of the bottom forming section reduces time for size changes and set-up adjustment. The counting arrangement is of special importance. Heretofore, on vertical delivery machines, the counting of large lightweight flat bags has been a difficult problem. Potdevin, however, claims to have avoided this trouble by adapting the patented counter used on the smaller "Century Line" machines.

Other desirable features on this machine are the trademark stamping device and self-contained power unit. Potdevin states that this machine, like the other "Century Line" models is compact and easy to operate.

## Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 5, 1939—The Government Printing Office has received the following bids for 33,800 pounds (100,000 sheets) of 75 per cent rag, lithograph finish map paper; Mathers-Lamm Paper Company, 11.479 cents; Graham Paper Company, 10.49 cents; Barton, Duer & Koch Paper Company, 10.87 cents; R. P. Andrews Paper Company, 10.73 cents; Virginia Paper Company, 11.6 cents; Stanford Paper Company, 11.12 cents; Walker, Goulard Plehn Company, 11.9 cents; and Mudge Paper Company, 11.09 cents.

For 150,000 sheets of 17 x 22 white gummed paper; Old Dominion Paper Company, $4.838 per M sheets; Cauthorne Paper Company, Inc., $4.79; Graham Paper Company, $4.58; Mudge Paper Company, $4.63; Stanford Paper Company, $6.00; Barton, Duer & Koch Paper Company, $5.50; R. P. Andrews Paper Company, $4.53; Enterprise Paper Company, $4.672 less 2 per cent; Andrews Paper House of York, $4.80; and Virginia Paper Company, $4.84.

For 5,000 pounds of No. 1 gummed kraft paper; Mathers-Lamm Paper Company, 6.99 cents; R. P. Andrews Paper Company, 7.2 and 7 cents; Mudge Paper Company, 6.77 cents; Whitaker Paper Company, 6.9 and 6.7 cents; Stanford Paper Company, 7.5 cents; Cauthorne Paper Company, 6.745 cents; Walker, Goulard Plehn Company, 7.6 cents; Resolute Paper Products Corp., 7.14 cents less 2 per cent; Enterprise Paper Company, 6.86 cents less 2 per cent; Andrews Paper House of York, 6.95 and 6.75 cents; and Old Dominion Paper Company, 6.98 cents.

The Government Printing Office has received the following bids for 42,250 pounds (250,000 sheets of 28 x 41) dull coated book paper; Stanford Paper Company, 5.84 cents; Whitaker Paper Company, 5.99 cents; and Paper Corp. of U. S., 6 cents.

For 29,447 pounds of 36 x 47½ white sulphite writing paper; Perkins-Goodwin Company, 4.43 cents; Cauthorne Paper Company, 4.71 cents; Stanford Paper Company, 5.25 cents; R. P. Andrews Paper Company, 5.48 cents; Barton, Duer & Koch Paper Company, 4.4 cents; Marquette Paper Company, 5.05 cents; Aetna Paper Company, 5.48 cents; and Mudge Paper Company, 4.79 cents.

For 88,340 pounds of 36 x 47½ yellow sulphite writing paper; Perkins-Goodwin Company, 5.18 cents; Old Dominion Paper Company, 5.143 cents; Cauthorne Paper Company, 4.96 cents; Stanford Paper Company, 5.75 cents; R. P. Andrews Paper Company, 6.2 cents; Barton, Duer & Koch Paper Company, 5.09 cents; Marquette Paper Company, 5.24 cents; Aetna Paper Company, 6.20 cents; Whitaker Paper Company, 4.992 cents; and Mudge Paper Company, 5.03 cents.

For 15,000 pounds of 22 x 28 binders board; Barton, Duer & Koch Paper Company, 5.25 cents and R. P. Andrews Paper Company, 5 cents.

For 28,000 pounds of 22½ x 28½, 280 pounds jute tag board and same 200 pounds; Mathers-Lamm Paper Company, 7.2 cents and 8.99 and 7.2 cents; Marquette Paper Company, 7.65 cents both; Whitaker Paper Company both 7.65 cents; and Mudge Paper Company, 7.25 cents both.

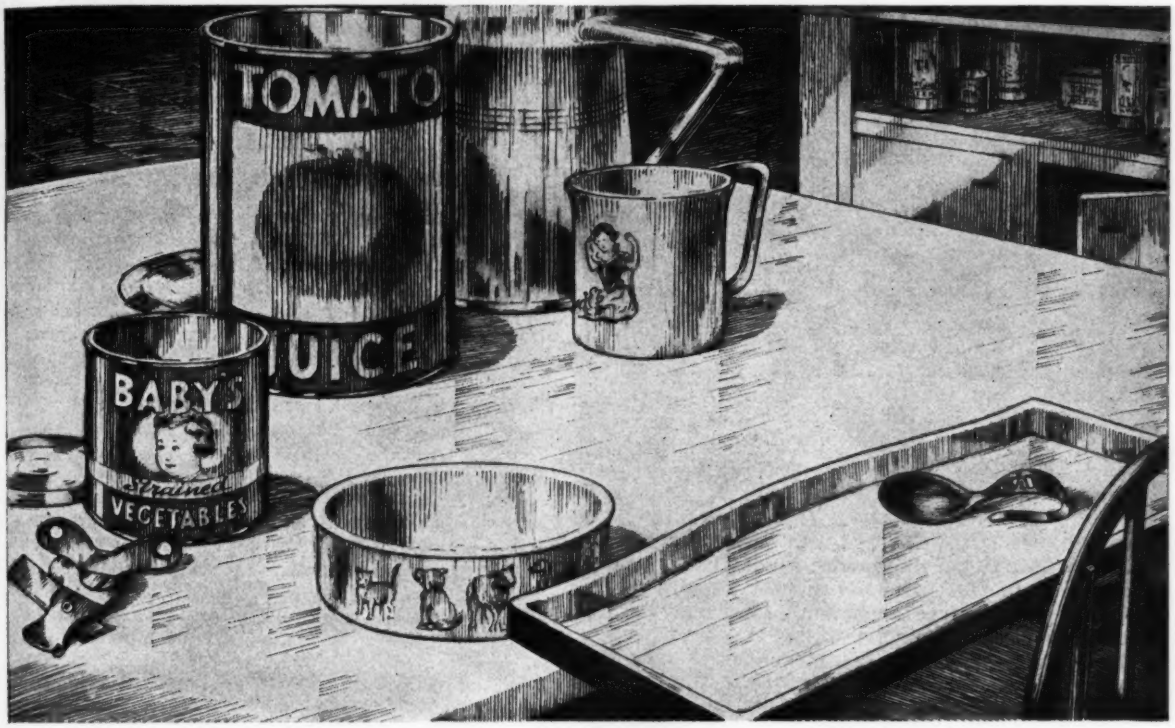
## New Electro-Chemograph

Applying the Dropping Mercury Electrode principle of analysis, Leeds & Northrup's new Electro-Chemograph automatically inks curves from which quantitative and qualitative analyses can be determined. Making possible quick and convenient analyses in those processes where its possibilities have been determined, the method eliminates dark rooms, developing processes and delicate galvanometer systems. Drawn in sight of the operator, the curve is inked on a wire, easily-read, permanent chart. Instruments are made up of standard L&N mechanisms proved reliable over years of use in other applications.

Although for the present, research laboratories establishing routine procedures will probably be its principal users, the Electro-Chemograph is a development of great significance to the chemical and allied industries . . . one with which progressive chemists and chemical engineers will find it well worth their while to become familiar.

This equipment is described in L&N's Technical Publication E-94(1). A copy will be sent upon request to Leeds and Northrup Company, 4934 Stenton avenue, Philadelphia, Pa.

INTERESTING USES OF ALKALIES




# Purifying Cooling Water to Cut Down Canned Food Spoilage...

In the attainment of present high quality standards of canned food, chlorination of the cooling water plays an important part. The food is sealed in hot, and because of the partial vacuum formed within the can on cooling, minute drops of water that remain in the seams after the cans are removed from the cooling tank may be drawn into the can. An opening of only one hundred thousandth of an inch is sufficient to permit the entrance of a large number of spoilage organisms, but if the water is pure there will be no spoilage when the openings in the cans seal during contraction.

A residual chlorine content of 1/10th part per million is sufficient to keep the water in the cooling tank sterile. Liquid chlorine or a sodium hypochlorite solution with high alkalinity to avert corrosion of the cans is used for this purpose.

The purity of COLUMBIA Liquid Chlorine itself makes it the frequent choice for purification projects, including water for drinking and bathing, as well as for paper and pulp mill operations. In similar manner, the purity of COLUMBIA Caustic Soda and other COLUMBIA products, coupled with prompt and understanding service, make them preferred by leading manufacturers in the paper industry.

# COLUMBIA

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • • •
MODIFIED SODAS • LIQUID CHLORINE • CALCIUM CHLORIDE

THE COLUMBIA ALKALI CORPORATION
EXECUTIVE SALES OFFICES: 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.
Plant: Barberton, Ohio
CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI • CLEVELAND • MINNEAPOLIS • PHILADELPHIA

## Dual-Air Propeller Fans

A new type of exhaust fan manufactured by the General Regulator Corporation, 2608 W. Arthington street, Chicago, Ill., is shown in the accompanying illustration. This design, known as the dual-air airplane type exhaust fan, is designed and constructed for all industrial requirements. It is recommended especially for factories, power plants, machine shops and wherever large volumes of air must be moved with a very minimum of electric current consumed. Fans are equipped with best grade, fully enclosed, special fan duty motors and are dust and moisture-proof. Of particular interest is the highly polished airplane type aluminum propellers, which are easy to clean to maintain maximum performance. All mounting rings are of cast aluminum, as are the motor brackets and supporting arms, and fully streamlined for highest efficiency. Catalogue may be obtained from the company.

## Indianapolis Demand Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 5, 1939—The local paper trade appears to have held its own during the last week in the demand increase which was apparent two or three weeks before. At the present time practically all attention is being turned toward Europe and the local executives are wondering just what effect the war will have on business here, particularly the paper business. Many believe that prices, already firm, are due to increase shortly.

Last week demand for book, cover and ledger all continued good and volume for August was above last year. There are continued inquiries which likely will materialize into orders. Prices are steady with no indication of disturbing factors.

No change is seen in the newsprint demand, volume remaining steady in both metropolitan and rural papers. Local publishers believe there will be a decided increase in lineage during September with both public schools and colleges opening.

A slight increase was seen last week in demand for building and roofing papers. There had been a slight lull during August, but the fall season is getting under way and jobbers believe it will be in full swing this week again. Volume for the year is far higher than last. Stocks in retail hands, while not heavy, are well balanced.

Paper bags and wrapping papers have shown an increase during the last week. Demand during the last month has been fair, due to the large amount of retail trade which has been carried on in this area. Tissues continue to move well with no price change. Container men report a slight increase during the last week. No change was seen in kraft, but volume is fair.

Waste paper men here believe hostilities will help their business for a time at least. Demand has increased slightly and prices are more staple. As in the past few weeks, most of the demand is coming for the better grades of both paper and rags.

## Riverside Add Hospitalization

The Riverside Paper Corporation, paper manufacturer, of Appleton, Wis., has added hospitalization and surgical operation benefits to its group program which since 1927 has provided employees with life insurance, now totaling approximately $150,000, and sickness and accident coverage. Announcement of the plan was made by E. C. Hilfert, secretary of the company.

The group program is being underwritten by the Metropolitan Life Insurance Company on a cooperative basis whereby the employer and employees share the cost.

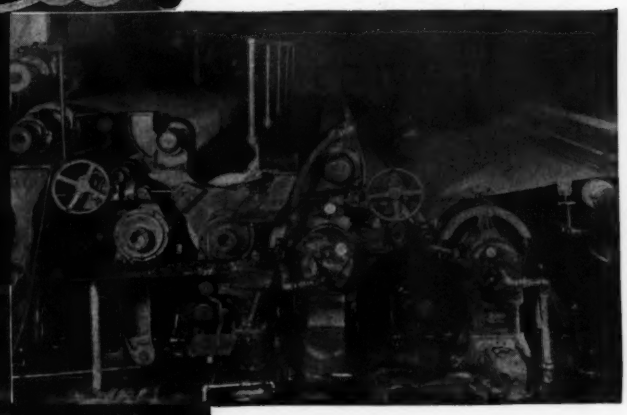
Under the present arrangement individual employees in the rank and file classification, when confined to a hospital, will receive $3 a day for a period not to exceed a maximum of 31 days. Surgical operation benefits range up to $150. The life insurance amounts to $1,000, while $12 a week will be paid in case of sickness or non-occupational injury. The plan includes visiting nurse care and the distribution of pamphlets on health conservation and disease prevention.

## Doc. Murdock Gets Tarpon

Presented herewith is a picture of "Doc" Murdock of the Champion Paper and Fibre Company, Canton, N. C. and a 6 foot 1 inch tarpon weighing 120-lbs., which he landed in one hour and two minutes at Port Aransas, Texas, August 26, using regulation light tackle—8 ounce rod and 27-lb. test line.

LANDS 120-LB. TARPON

*Improved!*



# BELOIT HORIZONTAL *Dual Press*

PATENTS PENDING

● The Beloit Horizontal Dual Press has been improved by incorporating a primary roll over the first suction press, adding another nip. Thus, this press is now equivalent to three presses instead of two, the first suction roll doing double duty.

● The success of the Beloit Horizontal Dual Press has been definitely established. This new press gives even better results.

**THE BELOIT WAY** BELOIT IRON WORKS PAPER MACHY BELOIT WIS **IS THE MODERN WAY**

BELOIT IRON WORKS BELOIT WISCONSIN

## Cameron Completes Machine Exhibit

Paper mill officials visiting the New York World's Fair would do well to take time out to make a short side trip to the plant of the Cameron Machine Company, 61 Poplar Street, Brooklyn, N. Y., in order to see the permanent exhibit of slitting and roll winding machines on display there, as well as the modern roll exhibit room, where one is surprised to find that in addition to handling the wide range of papers and boards being manufactured today in paper and board mills throughout the world, Camachine slitters and roll winders are used extensively in the rubber and textile industries.

The machine exhibit proper consists of an assortment of slitting and roll winding machines of different types and sizes such, it is said, as has never before been assembled under one roof.

Some of the machines are of universal application, but others are of special design. There are narrow machines and wide machines, heavy duty and light duty, two drum and riding roller equipped, one rewind and two rewind shaft machines.

One high speed slitter operates at 1500 feet per minute and it is equipped with a constant web tension mill roll control, which relieves the operator of the necessity to make adjustments on the mill roll brake friction with changes in the speed of the machine or the diameter of the mill roll. In addition, this particular machine is equipped with an electric eye side register control, which makes it possible to take telescoped rolls and wind them up with straight ends by guiding to a printed line or to the edge of the web.

Another machine in the exhibit is a heavy duty slitter for handling double faced waxed papers or other unevenly coated stocks. This is a two shaft or "Duplex" machine. Rolls are stagger wound assuring positive separation while special "Differential Rewind Shafts" allow for individual tension on each rewound roll.

A splicing and roll winding machine as used in newspaper and magazine press rooms is on display. It incorporates several novel features and is the object of considerable comment.

The newest machine in the exhibit is a Duplex slitter for tabulating card stocks. The slitting of tabulating card stocks calls for extreme accuracy and this machine handles the job efficiently. This slitter likewise incorporates a constant web tension control for the mill or parent roll.

The adjacent roll exhibit room is not the least interesting part of the permanent exhibit, in fact, an afternoon spent in studying the exhibit and the machines could not fail to prove profitable.

## Twine Club to Meet September 19

At a meeting held recently at the Blackstone Hotel, Twine Club decided to hold the fall luncheon of the club in the Tower Room of the Hotel Stevens, Chicago, at 12:00 noon on Tuesday, September 19, 1939, during the week of the convention of the National Paper Trade Association.

The executive committee and meetings committee expect to furnish the usual good show for the club's meeting. They have arranged for a splendid male quartet and other instrumental music during the luncheon hour which will be accompanied by the usual group singing. President Earl Beier will make a very brief report of the activities of the club since the June meeting and will then introduce a nationally known humorist and inspirational speaker who will be worth hearing. The price of the luncheon will be $2.50 per person. Attendance will be open to the members of the club and two guests for each member attending.

## Pacific Coast Mills Active

W. E. Green of Stowe-Woodward's New York office has just returned from a month's trip to the Pacific Coast where he combined a visit to the San Francisco World's Fair with a swing around most of the paper mills on the Pacific Coast. He was accompanied by George G. Guild sales representative of the Huntington Rubber Mills, Inc. of Seattle. Mr. Green reports that the mills which he visited were active and there was a general feeling of optimism.

## French Place Embargo on Rags

[FROM OUR REGULAR CORRESPONDENT]

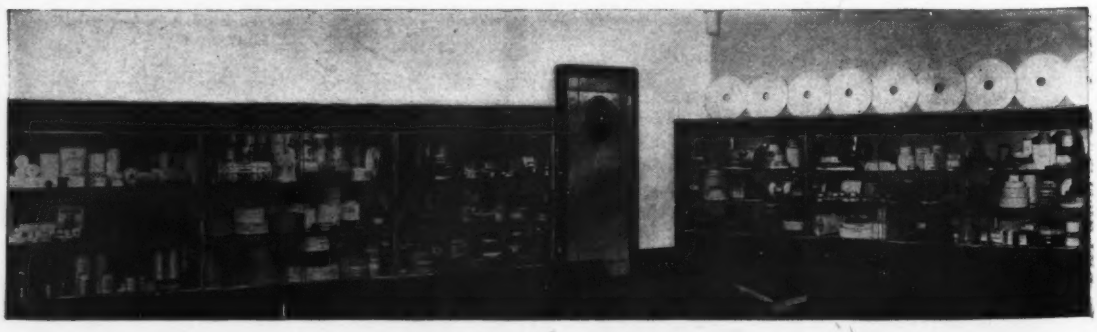
BOSTON, Mass., September 5, 1939—Commenting on current conditions in paper stock, a dealer notes that up to the middle of last week, there was no change in commodity prices. Since war conditions began in Europe, however, "everyone has turned bullish and prices are expected to advance rapidly." The French government has placed an embargo on exportation of rags, which includes roofing rags.

## War Conditions Bring Rush Orders

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 5, 1939—In some quarters, at least, offices of mill representatives here have received rush orders for paper since war conditions began in Europe.

Due to conditions abroad, a little more activity developed in box boards.



CAMERON PERMANENT ROLL EXHIBIT ROOM

## New Literature

Steel Horizons, Vol. 1, No. 3, issued by the Allegheny Ludlum Steel Corporation, Pittsburgh, Pa., attractively describes the application of stainless steel and the importance and value of this fine product in railroad equipment, many industries and in the home, with many colored illustrations of general interest.

Bulletin No. 250, issued by The United States Stoneware Company, Akron, Ohio, describes U. S. Standard and Roller type jar mills, for grinding and pulverizing chemicals, colors, pigments, inks, etc. Standard sizes are arranged for one to four "Loxeal" jars. These mills are recommended for heavy duty and long service and are shipped complete, ready for use.

Leaflet E-1175, issued by De Laval Steam Turbine Company, Trenton, N. J., describes worms gears in industry and gives varied applications of these gears in transmitting power from electric motors, water turbines, internal combustion engines, etc., to slow and moderate speed machinery of many kinds.

Three folders just issued by U. P. M. Kidder Press Company, Dover, N. H., describe the kidder super-speed roll winders, which the company states operate at 2000 feet per minute and more on almost any kind of paper, with blades virtually self-sharpening. The senior model webs are from 70 x 120 inches, and on the junior model up to 65 inches.

A new publication, GEA-2080, just issued by the General Electric Company, Schenectady, N. Y., describes the company's A-C and D-C Solenoids CR-9593. Solenoids supply a straight-line thrust, by magnetic action, for general industrial applications to machine parts, valves, and brakes. They possess the merits of compactness, low maintenance cost, give more work per watt input, and can be used for either direct or remote contact.

Publication No. GEA-2420, issued by the General Electric Company, describes the ratings, operation, construction and control of capacitor-motors, Type KC, single phase, 60 cycle, from ⅛ to ¾ h.p., at 1725 r.p.m., and ¼ to 1 h.p. at 3450 r.p.m. This type of motor is designed for the operation of domestic water pumps, shallow and deep well, vacuum heating pumps, sump pumps, etc.

A new publication, GEA-3071-A, issued by the General Electric Company, Schenectady, N. Y., describes the new diesel electric locomotives, stated to be the first small sized, low-priced diesel electrics, built primarily for use in and around industrial plants. Provided in 23, 35 and 43 ton capacities, these diesel-electrics embody the same fundamentals of design as the large switchers and they are adaptable for any special gauge.

Metal, Enclosed Switchgear, is the subject of publication GEA-2596A issued by the General Electric Company, Schenectady, N. Y. The features of the draw-out type of air circuit breakers for low-voltage feeders, construction and dimensions are given.

Oil-Blast Circuit Breakers, Type FLO, for outdoor use, are described in publication GEA-2426B issued by the General Electric Company, Schenectady, N. Y. The merits of this equipment include ease of installation, rigid construction, long-lived arcing contacts, simplicity of mechanism, ease of inspection and low upkeep cost. These circuit breakers are electric or manually operated.

The I-R motor pump, is described in folder Form 1917 issued by the Ingersoll Rand Company, 11 Broadway, New York. This pump is designed for all types of general service and is made in sizes to deliver 5 to 1000 gallons per minute and heads up to 500 feet. The unit is enclosed in a housing, requires no baseplate or foundation, and may be blotted down for operation in any position.

Pressure water filters is the subject of Bulletin 275A issued by William B. Scaife & Sons Company, Oakmont, Pittsburgh, Pa. The Scaife "Type S" filter is stated to require no concrete fill, is lighter in weight, stronger in construction and costs less to install than many other filters. Pressure filters are in daily use in thousands of industrial plants for obtaining clear water economically. Vertical and horizontal types with master control valve are described.

Water pipe sizes, a 52-page technical booklet issued by the Bridgeport Brass Company, Bridgeport, Conn., provides much concise information and tables for making piping layouts and estimates. It is particularly useful for architects, engineers, plumbing and heating contractors.

Manhattan rubber products for industry, is the title of a new condensed edition of a catalogue issued by The Manhattan Rubber Manufacturing Division, of Raybestos-Manhattan, Inc., 94 Townsend street, Passaic, N. J. Hundreds of mechanical rubber products are described, including belting, hose, packing, industrial asbestos friction material, rubber roll coverings, tank linings and abrasive wheels.

## Oxford Paper Co. To Discuss Fall Plans

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 5, 1939—General plans for fall and winter in connection with products of the Oxford Paper Company, Rumford, Me., will be discussed by representatives of the New York sales offices of that concern with the sales department of Carter Rice & Co., Corporation, at a breakfast meeting at the Parker House, Saturday morning, September 23, which will begin about 7:45 o'clock. Ted Pell, of the Oxford Paper Company, is expected to be among those present. Frank H. Winter, sales manager of Carter Rice & Co., Corporation, is to preside.

## Paper Bought Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D.C., September 6, 1939—During the week ended August 26, the Government purchased $72,682.30 worth of paper and allied products under the Walsh-Healey Act as follows: from Brown Company, Portland, Maine, $10,230.00 worth of filter material for the War Department; and from Joseph M. Price t/a Improved Mailing Case Company, N. Y. C., $62,435.00 worth of fiber containers for the War Department.

## Fire Damages Reliable Mill Supply Co.

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., August 28, 1939—Fire of undetermined origin gutted the two and a half story brick warehouse and offices of the Reliable Mill Supply Company, Inc., 205-207 West South street here recently. The company deals in paper stock and rags. All downtown fire apparatus was called to prevent spread of the flames. The loss has not been determined.

# CONSTRUCTION NEWS

***A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills***

## General Construction News

**Antioch, Cal.**—the Fibreboard Products, Inc., Russ Building, San Francisco, Cal., manufacturer of chip board, straw board and other paper board products, has approved plans for new addition to mill at Antioch, to be one-story, 80 x 370 feet, designed primarily for storage and distributing service. It is estimated to cost approximately $90,000, with equipment. General erection contract has been let to the K. E. Parker Company, 135 South Park street, San Francisco, and work will be placed under way at once. Leland S. Rosener, 233 Sansome street, San Francisco, is engineer. As recently noted in these columns, company has work under way on new one-story addition to branch mill at 4444 Pacific boulevard, Vernon, Los Angeles, Cal., 72 x 122 feet, for which general erection contract has been let to MacIsaac & Menke, 6624 Stanford street, Los Angeles. It will cost close to $50,000, with equipment, and is scheduled for completion at early date.

**Red Lake, Falls, Minn.**—The Red Lake Falls Company, manufacturer of fiber products, has approved plans for two new one-story plant units, 50 x 112 feet, and 40 x 85 feet, respectively, and will proceed with erection at once by day labor. Cost reported over $50,000, with equipment. M. E. Davis is general manager.

**Dayton, Ohio**—The Aetna Paper Company, manufacturer of bond and other writing paper stocks, has completed plans for new addition to mill at 135 Columbia street, consisting of a two-story structure, 70 x 100 feet, reported to cost close to $50,000, with equipment. General erection contract has been awarded to I. F. Weber & Company, Commercial Building, Dayton, and work will be placed under way at once.

**Neenah, Wis.**—The Neenah Paper Company, manufacturer of bond, ledger and other writing stocks, has plans for a pressure filter unit for boiler plant at local mill. Bids are being asked for construction and contract will be awarded soon. No estimate of cost announced. Charles A. Cahill & Sons, 724 East Mason street, Milwaukee, are engineers.

**Bathurst, N. B.**—Bathurst Power & Paper Company, Ltd., Sun Life Building, Montreal, Que., manufacturer of box board, test container board, kraft fiber products, etc., has preliminary plans under way for expansion in mill at Bathurst, comprising new one and multi-story unit, reported to cost close to $500,000, including equipment. Increased capacity will be carried out. It is proposed to begin work on program in the fall.

**Wilmington, Del.**—The Cork-Tex Products Company has been chartered under Delaware laws with capital of 2,500 shares of stock, no par value, to manufacture and deal in insulating board, cork board and kindred products. The incorporators include E. M. Harrigan and M. T. Mooney, Wilmington. New company is represented by William S. Potter, Delaware Trust Building, Wilmington, attorney.

**New York, N. Y.**—Albert Carman, Inc., has been incorporated with capital of $10,000, to operate a paper-converting plant for the production of lithographed and other paper goods. New company is represented by Walter L. Post, 84 William street, New York, attorney.

**Housatonic, Mass.**—The Rising Paper Company, manufacturer of writing paper stocks, has completed plans for new addition to mill, to be two-story, 35 x 200 feet, reported to cost in excess of $65,000, including equipment. Bids have been asked on general erection contract and award will be made soon. Proposed to begin construction early in the fall.

**Boston, Mass.**—The Boothby Fibre Can Company, 25 George street, manufacturer of fiber boxes and containers, has arranged for a long-term lease of former factory of the Ground Gripper Shoe Company at 84 Lind Park street, Roxbury, Boston, consisting of a main four-story building and several auxiliary structures, totaling about 50,000 square feet of floor space. Property will be remodeled and improved at once, with installation of equipment for new plant by Boothby company. It is proposed to remove present works to new location and carry out considerable increase in capacity.

**Asheboro, N. C.**—The Mid-West Box Manufacturing Company, organized recently to manufacture paper boxes and containers, has work nearing completion on new one-story plant on local site. It will be about 75 x 100 feet, and equipped for an extensive line of box production. Operations are scheduled to begin at early date. New company is headed by E. O. Schaefer, formerly general manager of the Old Dominion Box Company, Asheboro.

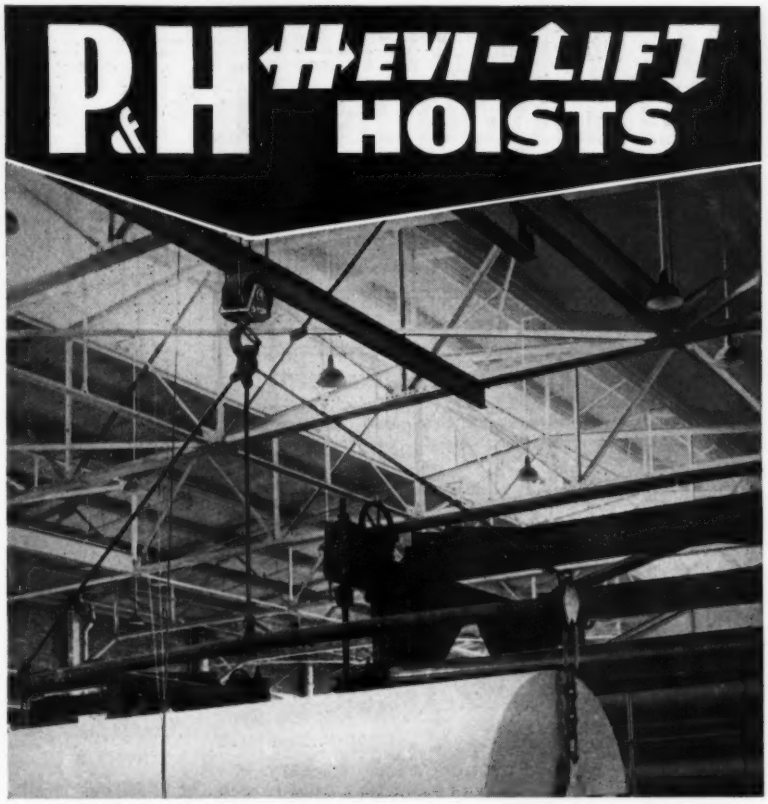
**Chicago, Ill.**—The Karolton Envelope Company, 2626 West Washington street, manufacturer of envelopes and other commercial paper products, has concluded negotiations for purchase of three-story and basement building at 1521-37 West Har-

rison street, heretofore held by the Illinois Bell Telephone Company, and will take possession at once. The structure totals approximately 115,000 square feet of floor space, and about one-half of this area will be used by the Karolton company for converting, storage and distributing, and other departments, including offices. Improvements will be made at once. Company will remove to new location early in October, and will provide equipment and facilities for increase in present capacity.

**Fredericksburg, Va.** — The Sylvania Industrial Corporation, 122 East 42nd street, New York, N. Y., manufacturer of cellulose transparent papers, is pushing construction of new one-story addition to mill at Fredericksburg, recently noted in these columns, and proposes to have the structure ready for occupancy early in the fall. An award has been made to the Belmont Iron Works, 22nd street and Washington avenue, Philadelphia, Pa., for structural steel framing; to the Richmond Fireproof Door Company, Richmond, Ind., for sliding fire doors; and to the Better-Built Door Company, Jenkintown, Pa., for overhead doors. New structure will be used for storage and distribution, and will be known as building "H", at the mill. Cost estimated about $45,000, inluding equipment. The Hughes-Foulkrod Company, 1505 Race street, Philadelphia, Pa., is general contractor.

**Los Angeles, Cal.** — The Armstrong Cork Company, 5037 Patata street, South Gate, Los Angeles, manufacturer of insulation board, cork board and kindred products, has completed plans for one-story addition, about 40 x 60 feet, to be used for expansion in production division. Bids have been asked on general contract and erection is scheduled to be carried out early in the fall. Main offices of company are at Lancaster, Pa.

**Austin, Tex.**—The Steck Company, manufacturer of paper products, has plans under way for installation of an air-conditioning and humidity control system for lithographing and paper stock departments. A new ventilating system also will be installed in other operating divisions, and air-conditioning of general offices. Work will be placed under way at early date. Lloyd D. Royer, Smith-Young Tower Building, San Antonio, Tex., is consulting engineer. E. W. Jackson is vice-president.




**Handle It "THRU THE AIR" To Save Time-Save Money**

**All through the paper industry . . . from raw materials to machines—to warehouse—to loading zone . . . P&H Hoists are simplifying the handling problem and saving money. P & H Hoist engineers have a wealth of experience that brings you the most practical, modern handling methods exactly suited to your needs. Why not ask a P & H Hoist engineer to call? Or write us for your copy of Bulletin H-5. The Harnischfeger Corporation, 4560 West National Ave., Milwaukee, Wisconsin.**

**HARNISCHFEGER CORPORATION**

HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

**Chicago, Ill.**—The Arvey Corporation, 3462 North Kimball avenue, manufacturer of cardboard advertising displays, has plans in progress for proposed addition to converting plant on adjoining site lately acquired from Commonwealth Edison Company, recently noted in these columns.

**Victoria, B. C.**—The Sidney Roofing and Paper Company, Ltd., Victoria, manufacturer of roofing and building papers, and kindred paper stocks, has plans maturing for new one-story plant unit, to replace a structure destroyed by fire a number of weeks ago. New building will be located on same site in the Industrial Reserve district, and is reported to cost close to $50,000, including equipment.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. 109 New York, September 7, 1939 No. 10

## COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

## BUSINESS EXPANSION

Private enterprise has made, through managerial ability and investment of funds, the necessary economic contribution to provide good wages and prosperity for millions of workers over a long period of time. Although private enterprise may not have provided a high enough level of prosperity, it is clear enough that industry and trade has not been ungenerous. This is plainly shown in the average high standard of living in this country. In comparison with all other countries the United States is far in the lead in respect to volume of business transacted and amount of wages paid for all forms of labor. Private enterprise has been alone responsible for the steady upbuilding of this industrial nation. This is equally true, of course, of agricultural growth. It is therefore quite apparent that private enterprise in all of its many forms of activity has been particularly successful in this country, and despite the large number of unemployed workers, private enterprise continues to provide higher compensation for such labor as it can profitably use, than any other system or country under the sun.

Business has made many mistakes, of course, and Government has also made many mistakes. One of the costly errors made by both business and government resulted in the stock market crash in 1929 and the following business depression, out of which we have yet to completely emerge. One reason why business has flowed at such a comparatively low rate for so many years, may be attributed to New Deal theories that when private enterprise falters and recedes, government should spend public funds to stimulate activity through increased purchasing power. Like many theories this philosophy has its attractions and its disadvantages. Unfortunately, the disadvantages outweigh the merits. Pump priming must always prove inadequate to perform that which it is expected to accomplish. The principal reason is that no matter how lavishly government can spend public funds, the funds at the disposal of the government for this purpose are many times smaller than supplied by private investors in normal times. And the greatest disadvantage of large public spending is that it undermines confidence in proportion to the size of the expenditure and the increase in the national debt, and as government spending increases private spending declines.

Now that Congress failed in its closing session last July to enact the President's proposal for another large-scale spending program, the American Federation of Labor recently made a public statement offering suggestions for business recovery. Business is now challenged by labor to provide the recovery which the defeated plan of President Roosevelt was expected to achieve. "It is important," said the AFL statement, "to fix several points in our minds as we consider this problem of lifting industrial production to higher levels. First, the outpouring of Federal funds has proved effective in expanding productive activity to a certain degree. This method played an important part in lifting the national income from $42,500,000,000 in 1933 to $71,850,000,000 in 1937. But there is a limit to the outpouring of Federal funds; we cannot go on indefinitely increasing the national debt.

"Secondly, Government spending alone cannot bring full recovery. It can act only as a stimulator, to start business revival by creating a demand for goods, and pave the way for private investment. The sums which private business borrows out of the nation's savings and spends for plant and equipment can change a low business level to a rapid expansion, even a boom. . . . Business has never had any organization for increasing productive activity. Increases in production have always depended on the personal judgment of individual business men who increased their investment when they saw an opportunity for profit large enough to justify the risk. Business today is actually in a particularly favorable condition for sound, healthy expansion. First, wage rates per hour are higher than ever before in our history. The average of 64 cents in industry as a whole today, and 65 cents in manufacturing compares with 56 cents in manufacturing in 1929. As soon as industrial plants are back on a full time scheduled this wage rate will automatically provide high buying power."

These quotations from AFL president William Green's economists, is a clear presentment of the more intelligent faction in labor and this organization advocates cooperation of business, labor and government to provide for the need of all groups as the only

sound basis for recovery. Unfortunately, it does not include in its thesis on depression and recovery, consideration of the other, the management side and handicaps which industry has been operated under in the form of government regulations and burdensome taxes. With the elimination of the severely restrictive surplus profits levy and changes in the capital gains tax, two of the most important deterrent factors in business recovery have been removed. High taxes due to excessive government expenditures continue to act as a brake on the expansion of productive activity, but despite these obstacles business continues to steadily expand. According to *The Guaranty Survey,* published by the Guaranty Trust Company, New York, "Developments in the steel industry are among the most convincing evidences of general business improvement. The demand underlying this expansion is reported to have been exceptionally well diversified and the recent gains have been achieved in the face of seasonal inactivity in the automobile industry. Construction activity continues to increase gradually. Contracts awarded in 37 States last month, according to F. W. Dodge Corporation, were moderately larger than in June and considerably greater than a year ago."

In the pulp and paper industries good progress has been made this year. In the first seven months of this year production of domestic newsprint increased 19.6 per cent, while the gain in Canada was 7.3 per cent. Production and sales in two other branches of the paper industry are now close to the highest level ever reached, with orders well balanced against this high output. Profits of twenty-nine leading companies for the like period were 38 per cent higher than last year. Private enterprise is forging ahead and some economists point out that, while the cost of living will increase during an European war, wages are expected to rise proportionately higher and the wage earner will have increased purchasing power. Many conservative business leaders appear confident that business expansion will continue to rise.

## Wood Pulp Statistics

The United States Pulp Producers Association, Oliver M. Porter, manager, 122 East 42nd street, New York, has just issued an 82-page booklet on "United States Wood Pulp Statistics, 1927-1938." The price to non-members of the association is $2 a copy.

In explanation, Mr. Porter states that "During each of the past three years we have gotten out a new edition of our booklet entitled 'World Wood Pulp Statistics'. This year, due to the complications of the international situation and the consequent difficulty of obtaining even relatively-current official statistics from many European countries, it has been decided not to issue a 1939 edition of that publication. We have, however, prepared a supplement to the 1938 edition which we are issuing as United States Wood Pulp Statistics 1927-1938."

## Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

| Months | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 |
|---|---|---|---|---|---|---|
| January | 77.5% | 63.9% | 90.3% | 76.1% | 65.8% | ..... |
| February | 81.7% | 68.7% | 90.1% | 77.9% | 70.0% | ..... |
| March | 84.0% | 69.6% | 90.3% | 76.0% | 70.5% | ..... |
| April | 82.9% | 68.3% | 92.1% | 82.3% | 70.0% | ..... |
| May | 80.2% | 69.0% | 90.6% | 81.6% | 69.4% | ..... |
| June | 79.5% | 66.0% | 87.3% | 80.7% | 72.3% | ..... |
| July | 74.9% | 72.0% | 81.8% | 77.3% | 64.9% | ..... |
| August | ..... | 77.2% | 82.9% | 81.5% | 70.9% | ..... |
| September | ..... | 76.3% | 78.6% | 80.5% | 71.9% | 58.2% |
| October | ..... | 82.5% | 73.5% | 87.6% | 75.6% | 64.7% |
| November | ..... | 79.6% | 61.9% | 88.0% | 75.3% | 61.7% |
| December | ..... | 74.4% | 54.5% | 85.9% | 71.2% | 59.6% |
| Year Average | ..... | 72.3% | 80.6% | 81.3% | 70.5% | ..... |
| First 34 weeks | 80.4% | 69.2% | 88.2% | 79.1% | 69.1% | ..... |

COMPARATIVE WEEKLY SUMMARIES[1]

| CURRENT WEEKS 1939 | | CORRESPONDING WEEKS, 1938 | |
|---|---|---|---|
| July 22 | 80.7% | July 23 | 76.3% |
| July 29 | 81.6% | July 30 | 77.1% |
| August 5 | 80.2% | August 6 | 73.2% |
| August 12 | 82.7% | August 13 | 77.2% |
| August 19 | 81.9% | August 20 | 78.0% |
| August 26 | 80.4% | August 27 | 80.1% |

The following statistics show the number of mills reporting by ratio groups:

| | Number of Mills Reporting—Current Weeks | | | | | |
|---|---|---|---|---|---|---|
| Ratio Limits | July 22, 1939 | July 29, 1939 | Aug. 5, 1939 | Aug. 12, 1939 | Aug. 19, 1939 | Aug. 26, 1939 |
| 0% to 50% | 66 | 69 | 71 | 55 | 66 | 51 |
| 51% to 100% | 238 | 234 | 226 | 240 | 211 | 161 |
| Total Mills Reporting | 204 | 303 | 297 | 295 | 277 | 212 |

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---|---|---|---|---|---|---|---|
| 1935 | 62% | 68% | 68% | 63% | 61% | 66% | 62% |
| 1936 | 62% | 67% | 67% | 70% | 69% | 70% | 69% |
| 1937 | 80% | 86% | 86% | 88% | 85% | 77% | 66% |
| 1938 | 54% | 60% | 61% | 57% | 58% | 56% | 57% |
| 1939 | 60% | 67% | 71% | 69% | 64% | 67% | 63% |

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|
| 1935 | 67% | 71% | 77% | 71% | 61% | 66% |
| 1936 | 75% | 78% | 82% | 80% | 74% | 72% |
| 1937 | 74% | 69% | 65% | 55% | 45% | 73% |
| 1938 | 66% | 66% | 70% | 65% | 59% | 61% |

Week end. July 22, 1939—70%
Week end. July 29, 1939—70%
Week end. Aug. 5, 1939—70%
Week end. Aug. 12, 1939—71%
Week end. Aug. 19, 1939—72%
Week end. Aug. 26, 1939—72%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

## Begin Pulp Investigation

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 6, 1939—Work has been begun by the United States Tariff Commission experts in connection with the resolution passed at the last session of Congress and introduced by Senator Borah of Idaho calling for a wood pulp and pulpwood investigation.

In 1935 Borah introduced a similar resolution but it was not until 1937 that the report was finally made to Congress. This new investigation will bring that former survey up to date as to figures and facts. The Borah resolution called for a report by April of next year which means that the Commission officials will not have any time to waste in their work.

In the 1935 investigation the material was gathered both by field work and questionnaires. The answers to the questionnaires held up the report and so unless the present situation is changed questionnaires will not be used in the present survey.

LYDIAN ITALIC
It is with
IT IS WITH TYPES
It is with type as a
It is with
IT IS WITH TYPE AS
It is with type as a
It is with tr
IT IS WITH TYPE AS A
It is with typ
It is with type a
It is with type as a n

# But the Paper Has Got to Be Good!

*"This new type face is just right for the job, but the paper has got to be good. It would be criminal to lose any of the beauty of this type with inferior paper".*

That's not an unusual demand. Most printers hear it time and again. Nor is it any cause for alarm —the paper manufacturer always has clean-cut type reproduction in mind when coated papers are being formulated.

When the manufacturer wants a coated paper that is really "WHITE AND BRIGHT", when the HIGHEST OPACITY is essential—and when these results must be obtained with ECONOMY—a Zinc Sulfide Pigment is the answer.

With a CRYPTONE or ALBALITH Zinc Sulfide Pigment in the coating formula, the manufacturer is not only assured of all these qualities, but he secures what can be termed "extra dividends"—(1) easy dispersion in water vehicles assuring a uniform coating, (2) increased resistance to mildew in the finished coated stock, and (3) less bacterial action on the casein formulations in the coating department.

Our technical staff will be glad to cooperate at any time.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK

ZINC SULFIDE PIGMENTS IN PAPER

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# Review Of Paper Industry Literature

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.**

## Fillers

**Effect of Loading on Paper.** Y. Saeki and M. Suzuki. J. Cellulose Inst. Tokyo 14:160-174 (1938). —Factors affecting retention of various fillers and the effects of these fillers on the properties of the paper are studied. It is concluded that particle size is the main factor governing retention, which consists mainly of a mechanical filtration action of the pulp fibers during web formation. Retention can be increased by chemical means, but this applies almost entirely to the most finely-divided fillers.—A.P.-C.

**Paper with an Alkaline Filler.** Harold R. Rafton, assignor to Raffold Process Corporation. U. S. pat. 2,115,747 (May 3, 1938).—In the manufacture of paper filled with calcium carbonate and sized with rosin, the drying temperature is maintained at not over 75° C. (suitably about 45° to 65° C.) until the major part of the drying has been effected. (Cl. 34-24)—A.P.-C.

**Alkaline Earth Filler for Use in Paper Making.** Otto Kress and Charles E. Johnson, assignors to The Institute of Paper Chemistry. U. S. pat. 2,123,173 (July 12, 1938).—An alkaline earth filler is prepared by mixing with a sludge of alkaline earth solids, such as a lime mud in finely divided condition, an emulsion of substantially inert wax material such as paraffin stabilized with an acid-precipitatable, proteinaceous, protective colloid such as casein and adding an acidic reagent such as alum, so that the particles of alkaline earth material are coated with a film of wax-like material which in turn is protected by the colloid (the ratio of the proteinaceous colloid to the wax material being at least about 1:4). (Cl. 134-58)—A.P.-C.

## Drying

**Paper Drying System.** John W. Bell. Fr. pat. 827,491 (Oct. 5, 1937).—Paper machine driers are enclosed in a casing communicating with the atmosphere through openings of restricted size. The steam formed by evaporation of the water contained in the paper is partially drawn off, compressed and used for heating the driers; the remainder of the steam generated by evaporation of the water from the paper is allowed to escape, thereby preventing air from entering into the casing.—A.P.-C.

**Effect of Vacuum Drying on the Properties of Paper.** I. I. Kovalevskii. Bumazhnaga. Prom. 15, No. 2:22-24 (May, 1937); Chimie & Industrie 39: 953 (May, 1938).—Vacuum drying of paper is more rapid and is carried out at lower temperature than ordinary drying. It gives a smoother, softer, untransparent paper, that absorbs printing ink better but has a lower mechanical strength than paper dried in the usual way. Vacuum-dried paper is relatively porous and it would therefore be difficult to obtain therewith a hard-sized sheet.

**Apparatus for Drying and Impregnating.** Frederick A. Waldron. U. S. pat. 2,125,364 (Aug. 2, 1938).—The material is passed from the atmosphere through a liquid seal (preferably mercury) and communicating with a vacuum chamber, so that air and gases may be removed from the strip. The vacuum chamber is associated with one side of a liquid seal having a coating and impregnating liquid. The surface of this liquid may be exposed to the atmosphere so as to permit the sucking up of the liquid. The strip material is thus passed directly from the vacuum into the liquid and carried underneath the surface of the liquid so as to be subjected to a pressure difference depending upon the amount of vacuum and the depth of immersion below the exposed surface of the coating and impregnating liquid. The strip material then passes upwardly through the liquid seal and into either the same chamber, to another vacuum chamber, or to a pressure chamber where it may be heated and dried either under pressure or vacuum, as occasion requires. The material is then passed through another liquid seal, preferably mercury. (Cl. 91-55)—A.P.-C.

**Paper, Board, or Pulp Drying.** Sigbjörn P. H. E. Holgersson. Brit. pat. 481,237 (March 8, 1938). —The web is heated immediately before entering the press by means of steam supplied to its surface from a chamber or steam box.—A.P.-C.

**Paper Machine Driers.** Bernard A. Malkin, assignor to Dominion Engineering Works, Ltd. U. S. pat. 2,126,486 (Aug. 9, 1938).—The spindle gears and bearings in the gear side of the drier frame are arranged so that the bearings lie outside the gears and may be readily removed from the spindles without disturbing the gears. The gears are made in sections comprising a ring section carrying the gear teeth and a spider or hub section by means of which the ring sections are mounted on the spindle. The ring sections of the gears are provided with central openings of sufficient diameter to permit these sections to be drawn outwardly over the spindle bearings without disturbing the latter. (Cl. 74-421)—A.P.-C.

**Drier Felt.** Benjamin L. Whittier, assignor to Mt. Vernon-Woodberry Mills, Inc. U. S. pat. 2,115,658 (April 26, 1938).—A three-ply woven drier

felt comprises a cotton filling and warp threads each passed about alternate picks of filling in each of two adjacent plies, every third warp thread in the surface ply being an asbestos thread with the remaining warp threads being of cotton. (Cl. 139-420)—A.P.-C.

**Apparatus for Securing Uniform Drying of the Sheet on Paper Machines.** Arthur E. Broughton. U. S. pat. 2,119,771 (June 7, 1938).—A group of drier cylinders (suitably 4) at the wet end of the machine are maintained under constant steam pressure. Should changes occur in the steam pressure, means are provided for automatically restoring the pressure in these cylinders to the predetermined constant value, and simultaneously the pressure in the remainder of the drier cylinders is varied in such a manner as to maintain the moisture content of the sheet constant at the dry end of the machine. (Cl. 34-48)—A.P.-C.

**Device for the Regulation of the Moisture Content of Webs of Stock, Especially for Paper Machines.** Askania Werke A. G. Berlin Friedemau. Ger. pat. 647,911 (Feb. 28, 1933).—The regulator automatically regulates the amount of steam to the driers.—J.F.O.

**Process and Apparatus for Drying Paper.** Earl E. Berry, assignor to Beloit Iron Works. U. S. pat. 2,111,834 (March 22, 1938).—Increased drying capacity for a suction press is obtained by lifting the web off of the felt before the latter reaches the suction area of the suction roll, and then directing the web back into contact with the felt as it passes through the nip of the press. (Cl. 92-49)—A.P.-C.

**Drying Control Mechanism for Paper Machines.** Avery H. Stanton, assignor to Mason-Neilan Regulator Company. U. S. pat. 2,122,362 (June 28, 1938).—A tension roll responsive to changes in tension of the paper sheet due to moisture content, and a temperature bulb responsive to changes in temperature in the drying cylinder, operate the control valve governing the supply of steam to the drier cylinders through their separate or joint action. An independent pressure system (preferably air, and ordinarily exhausting to the atmosphere) is used as an operating pressure to actuate the control valve governing the steam supply, and operates through a pilot mechanism and exhaust valve, comprising an exhaust orifice and flapper lever. Compensation to prevent "hunting" is provided from the operating air pressure, which operates to check or compensate the action of the exhaust valve in one direction in response to changes in moisture content or temperature of the cylinders by providing a slight movement of the exhaust valve in the opposite direction. (Cl. 34-38)—A.P.-C.

**Automatic Steam Control for Paper Machine Driers.** Frederick A. Stickle, assignor to Stickle Steam Specialties Company. U. S. pat. 2,120,079 (June 7, 1938).—The tendency to overcontrol is reduced and the necessity for manually shutting off the steam when the web breaks is eliminated by superimposing upon the tension control of the prior art a control based on the physical condition (temperature or pressure of the steam supplied to the driers). This superimposed control acts to modulate the tension control in such a manner as to prevent excessively rapid changes in the steam supply which might be caused by sudden or temporary changes in the moisture content of the paper. In case of a break in the web, the tension control ceases to function and the superimposed auxiliary control operates to maintain the steam pressure in the drier between predetermined maximum and minimum limits, which are chosen so that the rolls are neither overheated nor permitted to cool unduly. (Cl. 34-48)—A.P.-C.

## Testing

**The Permanganate Number and its Application in Determining the Degree of Cooking of Eucalypt Sulphate Pulps.** P. B. Edwards and A. W. Mackney. J. Council Sci. Ind. Research 11:185-200 (1938).—A study of the influence of various factors on the Oestrand method of determining the permanganate number. A straight-line relationship was found between temperature and permanganate number over the range of 20 degs. to 30 degs. C., the variation being 0.13 unit per degree. No variation in permanganate number was found over the range of 180 to 500 r.p.m.; stirring at the rate of approximately 350 r.p.m. was therefore adopted, giving smooth stirring and avoiding splashing. For practical purposes the reaction is complete within 5 min. The total permanganate absorbed was found to be independent of the rate of back titration. Up to a consumption of about 25 cc. of permanganate, a straight-line relationship is obtained between weight of pulp and permanganate consumed. Beyond this a distinct decrease in permanganate number is observed with larger amounts of pulp. Provided a sufficient excess of permanganate is added, a maximum value is reached which corresponds to that obtained by the Oestrand method when the permanganate consumption is below 25 cc. Therefore, for any weight of pulp it is possible to derive a constant permanganate number provided that the ratio of the number of cc. of permanganate added to the number of cc. consumed is not less than 50:25. To provide a safe margin this ratio has been increased to 5:2 and was used in all cases in which the permanganate consumption for 1 g. of pulp was found to exceed 20 cc. The ratio of permanganate to sulphuric acid to water must remain at the value 5:2:18. The values obtained by this modified method are termed "true" permanganate numbers. A curve is given relating them to Oestrand numbers over the range 20 to 40. Beyond 40, the error becomes too great for a valid relationship. The permanganate number was correlated for 55 pulps from three Eucalyptus species with the solubility in sodium hydroxide (loss in weight of the pulp after boiling for 1 hr. with 0.5% sodium hydroxide), the percentage of lignin (72 per cent sulphuric acid after alkali extraction) and chlorine number (weight of chlorine absorbed by 100 g. of pulp from fresh chlorine water). Conclusions: the permanganate number and chlorine number measure the sum of lignin and sodium hydroxide soluble rather than the lignin alone; the permanganate number can be determined more accurately than the chlorine number; the permanganate number determination supplies a rapid method of estimating the degree of cooking but cannot satisfactorily replace the lignin determination.—A.P.-C.

**Apparatus for Determining the Opacity of Paper and Other Materials.** Otto Maass and Ronald E. Richardson, assignors to The Canadian Pulp and Paper Research Corporation. U. S. pat. 2,125,639 (Aug. 2, 1938).—The invention consists in various improvements in apparatus of the type in which light sensitive cells are balanced against each other so that the current-modifying effect obtained by interposing a sample of the paper between one of the cells and a light source may be readily determined as an accurate measure of the opacity of the sample.—A.P.-C.

# Resin In Paper*

The total resins in a finished sheet of paper consist of natural resins in the pulp from which the paper is made, plus any resins added in sizing. This method combines qualitative and quantitative determinations of total resins.

## Qualitative Test

A positive result obtained by both of the following procedures shall be regarded as conclusive evidence of the presence of resin in papers.

### Lieberman-Storch Test

Place about 1 gram of the paper, cut into small pieces, in a clean, dry test tube. Add 5 cc. of C.P. acetic anhydride and boil down to about 1 cc. (*Caution*—The fumes of the anhydride are very irritating and should be burned as they leave the mouth of the test tube.) Pour the liquid residue into a clean, dry porcelain crucible and cool to room temperature. If any waxy particles separate out, they should be filtered off on a dry filter paper. Add carefully, down the side of the crucible, one drop of conc. sulphuric acid. A fugitive, rose-violet coloration formed where the acid meets the anhydride indicates resin.

### Raspail Test

Place the paper on a glass or porcelain plate and apply a drop of a nearly saturated solution of sugar. After a few moments remove the excess sugar solution with filter paper. Add a drop of conc. sulphuric acid to the sugar on the paper. A raspberry-red coloration indicates the presence of resin.

## Quantitative Determination

This method for the determination of resin depends upon the conversion of insoluble resinates to alcohol-soluble resin by the action of a strong, volatile acid of a definite concentration for a definite length of time. Thus, a minimum of nonresinous material, such as cellulose hydrolysis products, are formed. Separation of the resinous from the nonresinous materials is accomplished by dissolving out the resin from the dried extract with anhydrous ether, in which nonresinous materials, including starches and glues, are insoluble. For further details consult the original literature *(3)*. If waxes and fats, which may dissolve in the anhydrous ether, are present they must be separated from the resinous material by saponification.

If the presence or absence of mineral matter which reacts with hydrochloric acid or is dissolved by it and of paraffin or similar wax in the paper under test is not definitely known, qualitative tests for them should be made, as their respective absences permit the omission of certain steps in the procedure.

### Apparatus

A suitable extraction apparatus, such as the soxhlet or Underwriters', is required.

### Reagent

*Extracting solvent:* To 1 liter of 95 per cent ethyl alcohol add 4 cc. of conc. HCl and mix.

### Test Specimen

The test specimen shall consist of strips about 0.25 x 1.6 in. (6 x 40 mm.). It should not be ground, for more nonresinous materials are then extracted. The strips shall be cut from the sample in such a way as to be thoroughly representative of it.

### Procedure

With the specimen strips in moisture equilibrium with the atmosphere of the balance, weigh out 5 to 7 grams of strips to the nearest 10 mg. Immediately thereafter weigh out test specimens for the moisture determination, which shall be made according to TAPPI Standard T412m-35. (If the paper contains paraffin or similar wax, or oil, it may not be practicable to determine moisture. In such cases the moisture determination may be omitted.)

If mineral matter reacting with, or dissolved by, hydrochloric acid is present, immerse the test specimen for the resin determination in approximately normal aqueous HCl for 5 minutes, drain off the acid solution, wash the specimen free from acid with tap water followed by distilled water, and dry at room temperature. If acid-reactive or acid-soluble mineral matter is absent, omit this preliminary acid treatment.

Place the strips lengthwise in the syphon cup of the extractor, taking care to avoid packing them together tightly. For the extraction use about 2-2.5 times the volume of solvent required to fill the syphon cup. Extract at a rate of 15 syphonings per hour (which should yield a volume of about 250 cc. of solvent distilled per hour) for a period of 2 hours for uncoated or nonsurface-sized papers and 2.5 hours for coated or surface-sized papers. The extraction should not be continued much longer than specified.

When the extraction period is completed, evaporate off the solvent in the flask on the steam bath until the odors of alcohol and HCl are no longer noticeable. Place the flask in an oven at 100 deg. C. for 15 minutes, cool to room temperature and add 20 cc. of anhydrous ether. The resin dissolves in from 5 to 30 seconds, but if covered by foreign material it must be uncovered by scraping the mass with a stirring rod. After standing 15 to 20 minutes to further the coagulation and settling out of the foreign matter if necessary, filter the ether solution with suction through a fine-pore filter paper cut to fit a Gooch crucible, directly into a weighed beaker. It is usually necessary to refilter the filtered solution through the same paper. Another 20-ml. portion of ether is used for rinsing, adding the rinsing to the solution in the weighed container. Evaporate the ether, then dry in an oven at 100 deg. C. for 15 minutes and weigh to the nearest 1 mg. Repeat drying and weighing until weight is constant to $\pm$ 1 mg.

If paraffin or similar waxes are present after weighing the container plus resin and wax, add about 22 cc. of 0.5 *N* alcoholic potash solution, heat to not over 60 deg. C. for 15 minutes, cool to room temperature, and transfer to a separatory funnel. Wash the beaker with about 25 cc. of ether and then with about 50 cc. of water, adding all washings to the separatory funnel. Add sufficient water or ether, or both, so that the funnel contains about 25 cc. of ether and 150 cc. of water. Shake the funnel well, add about 2 grams

* TAPPI Standard T408m-39; Tentative Standard Feb. 27, 1917; Official Standard July 1926; Corrected Sept. 15, 1936; Revised 1939. *Note:* The qualitative method was formerly printed as T408m-36 and the quantitative method as T416m.

of NaCl, shake the funnel once more, and allow separation of the liquids. Draw off the water solution into another separatory funnel and wash with 25 cc. of ether. Drain the two ether solutions into a weighed beaker, wash both funnels with about 20 cc. of ether, adding the washings to the beaker, and evaporate the ether. Dry the container and residue at 100 deg. C. (see note) for 15 minutes and weigh to the nearest 1 mg. Repeat the drying and weighing until weight is constant to ± 1 mg. The material thus obtained will be paraffin or similar wax, plus the unsaponifiable material from the resin, which, for most purposes and in the absence of definite knowledge regarding the particular resin in the paper under test, may be assumed to be 5 per cent of the resin in the paper. To obtain the weight of the resin, therefore, divide the weight of the combined resin and wax, less the weight of the wax, by 0.95.

*Note:* If the paper contains waxes or oil volatile at 100 deg. C. and it is not practicable to dry the residue at a lower temperature, the resin should be separated from the oil by saponification, and determined directly, as prescribed in the following alternative method.

*Alternative treatment of resin-wax extract where a direct determination of the resin is desired:* Wash the weighed resin-wax residue obtained from the alcohol-extracted paper into a wide-mouthed flask, using about 25 cc. of ether. Add about 22 cc. of 0.5 *N* alcoholic potash and about 100 cc. of water. Heat the contents of the flask to boiling under a reflux condenser for 30 minutes, cool to room temperature, add about 25 cc. of ether, transfer to a separatory funnel, and wash the flask first with water and then with ether, adding the washings to the funnel. Add about 2 grams of NaCl to the separatory funnel, shake well and let the liquids separate. Draw off the water solution into a beaker. Add 50 cc. of water and about 2 grams of NaCl to the ether solution in the separatory funnel, shake well, allow separation of the two liquids and draw off the water solution, adding it to the first one obtained. Add to the combined water solutions 2 drops of methyl orange indicator solution, then carefully acidify by adding 5 *N* sulphuric acid until the solution is definitely pink, and then add 1 cc. more of the acid. Cool the solution to room temperature, transfer to a separatory funnel, add 25 cc. of ether, and wash the beaker with about 10 cc. of ether, adding the washings to the funnel. Add about 5 grams of NaCl, shake the funnel well, allow separation of the liquids, draw off the water solution into another separatory funnel, wash it twice more, using about 20 cc. of ether each time. Transfer all ether solutions to a weighed beaker, washing all containers with ether. Evaporate the ether, dry in an oven at 100 deg. C. for 1 hour and weigh to nearest 1 mg. Repeat the drying and weighing until weight is constant to ± 1 mg. The weight of the resin thus found is assumed to be 95 per cent of that in the paper.

*Note:* If the paper contains saponifiable fats or greases in addition to resin, the alternative method described above will give results higher than the true resin content, as they will be included with it. In this case, the analyst may apply such modifications to the method as are considered justifiable and the report should state what modifications of the Standard method were used.

### Report

The result of the resin determination shall be expressed to the nearest 0.1 as a percentage by weight of the paper dried at 100-105 deg. C. wherever practicable. When this is not practicable, it shall be as a percentage of the paper as received or air-dry, and the report shall so state.

The report shall be the average of at least two determinations. The percentage results of duplicate determinations should agree within 0.2.

### Additional Information

(1) Sammet, C. F., "Quantitative Determination of Rosin in Paper", *Ind. Eng. Chem.* 5, 732 (Sept. 1913); *Paper* 13, no. 1, 17 (Sept., 1913).
(2) Sutermeister, E., and Torrey, W. V., "The Determination of Rosin in Paper", *Paper Trade J.* 94, no. 3, 33 (Jan. 21, 1932).
(3) Launer, H. F., "Simplified Determination of Resin in Papers and Pulps", National Bureau of Standards *J. Res.* 18, no. 2 (Feb. 1937), *Res. Paper* RP973.

## Packaging Institute To Meet

Announcement has been made that Packaging Institute, Inc., through its President, William M. Bristol, Jr., invites companies in the packaging field to send representatives to its first annual meeting, to be held October 19-20, at the Edgewater Beach Hotel, Chicago. It was stated that the Institute, which now comprises packaging production, machinery and supplies divisions, will consider the formation of a fourth, or designers, division. New members were also announced.

In extending this invitation, Mr. Bristol said: "The October meeting of the Institute will bring together for the first time all factors in the packaging industry for the specific purpose of adopting a program-of-work for the industry as a whole—in the interest of better packaging. Included in the packaging industry are, of course, machinery manufacturers, suppliers and designers, as well as the production managers who use packaging machinery and supplies. The Institute provides a common ground for cooperative work and simplification and elimination of packaging difficulties. We cordially ask the firms and individuals who constitute the packaging industries covered by the Institute membership, to be represented at this meeting, and cooperate with us in planning our program and activities. We expect to announce shortly names of leading speakers who will address the convention on packaging topics."

Mr. Bristol also stated that the Institute is concerned wholly with the *technical* advancement and aspects of packaging—not commercial or other individual problems of the numerous product and specialized groups which comprise its membership, and therefore does not intend to duplicate the functions of existing organizations which serve those particular groups.

## Lange's Chemical Handbook

The third edition of "Lange's Handbook of Chemistry" has just been published by Handbook Publishers, Inc., Sandusky, O., at $6 a copy. The book, comprising 1,830 pages, is a comprehensive source of useful information of particular interest to chemists, physicists and students of these subjects.

The material has been admirably selected to include the data most frequently required by chemists who neither have the time to refer to many other texts to obtain it, or the facilities of a technical library at hand.

The thorough manner of indexing is a commendable feature and enhances the value of the book for ready reference.

All the tables in previous editions have been retained and a number of new tables are included, while some eleven tabulations in the second edition have been revised and extended in this latest edition.

# Starch in Paper*

## Qualitative

A positive result obtained by the following method shall be regarded as conclusive evidence of the presence of starch in paper.

Boil about 0.5 gram of paper for several minutes with 10 cc. of water. Filter off the extract, cool it, and add one drop of approximately 0.001 *N* iodine solution. A blue coloration indicates starch. If only a faint violet coloration is obtained, this should be disregarded, as nonstarch constituents of paper sometimes give such reaction.

*Note:* It is convenient to make an approximately 0.01 *N* stock solution of iodine (0.13 gram I and 2.6 grams KI in 100 cc. water) and dilute a portion of this to a pale yellow color (about 0.001 *N*) each time a test for starch is made.

## Quantitative

### Apparatus

The balance used for weighing shall be sensitive to 1 mg.

### Reagents

*Ammonium Hydroxide*—Mix 400 cc. of conc. $NH_4OH$ with 700 cc. of water. This solution is approximately 6 *N*.

*Hydrochloric Acid*—Dilute 5 volumes of C. P. conc. HCl with 4 volumes of water.

*Iodine Solution*—Approximately 0.02 *N*. Dissolve 5 grams of KI in about 10 cc. of water. Then dissolve in this solution 2.6 grams of iodine. Dilute with water to 1 liter.

*Universal Indicator*—Dissolve 0.005 gram of thymol blue, 0.0125 gram of methyl red, 0.050 gram of bromthymol blue, and 0.100 gram of phenolphthalein in 100 cc. of neutral, 95 per cent ethyl alcohol. Neutralize the solution with 0.05 *N* NaOH and dilute to 200 cc. with water. The indicator solution should then be green.

To determine the *p*H value of a solution, add 0.5 cc. of the universal indicator to 5 cc. of the solution under test in a comparator tube of approximately 0.5 in. inside diameter, mix, and note the color of the mixture. The color indications for *p*H values from 4 to 10 are as follows:

| Color | pH value |
|---|---|
| Red | 4 |
| Orange | 5 |
| Yellow | 6 |
| *Green | 7 |
| **Blue | 8 |
| Indigo Blue | 9 |
| Violet | 10 |

*Light green with solutions obtained from paper.
**Dark green with solutions obtained from paper.

*Note:* The universal indicator described is that of Yamada (see references). It is useful for determining the *p*H value of a solution to the nearest whole number.

*Asbestos for Gooch Filters*—Digest the asbestos, which should be the amphibole variety, with dil. HCl (1:3) for 2-3 days at room temperature. Wash free from acid. Digest for a similar period with 10 per cent NaOH solution and then treat for 3-4 hours with hot, alkaline tartarate solution of the strength used in sugar determinations (old solutions which have stood for some time may be used). Wash the asbestos free from alkali; digest with dil. $HNO_3$ (1:3) for 3-4 hours; wash free from acid and shake with water into a fine pulp.

*Fehling's Solutions* (Allihn Modification)

Solution A—Dissolve 69.3 grams of $CuSO_4 .5H_2O$ of high purity and as free from Fe as possible in 1 liter of water.

Solution B—Dissolve 250 grams of KOH of good quality and 345 grams of Rochelle Salts (potassium sodium tartarate) in 1 liter of water.

Mix equal volumes of *A* and *B* immediately before use.

If the starch is to be determined by titration, the following solutions will also be needed:

*Molybdophosphate Solution*—Dissolve 100 grams of sodium molybdate (43 per cent Mo) and 75 cc. of syrupy $H_3PO_4$ (85 per cent) in a solution consisting of 275 cc. of conc. $H_2SO_4$ added to 1750 cc. of water.

*Potassium Permanganate Solution—N/30*—Dissolve about 16 grams of $KMnO_4$ in 1 liter of water. Allow this 1 *N* solution to stand in the dark, preferably for 1 month, then dilute a portion of it 30-fold and standardize against sodium oxalate.

*Saliva*—Directions for procuring this are given under Procedure.

### Test Specimen

The test specimen shall consist of 5 grams of paper, weighed to the nearest 5 mg. It shall be thoroughly disintegrated. Soft papers may be macerated in a small quantity of water. Hard papers may have to be torn into small pieces and shaken in a stoppered bottle with about 75 cc. of water and some lead shot. However prepared, the test specimen shall be thoroughly representative of the sample submitted for test.

*Note*—The paper should not be ground as papers containing mineral filler, when disintegrated in a mechanical grinder, lose considerable of the mineral filler and may also lose starch.

Determine the moisture in the test specimen according to TAPPI Standard T-412m-35, using a separate portion weighed at the same time the specimen for the starch determination is weighed.

### Procedure

After the test specimen has been macerated in water remove the lead shot, if present. If the mixture is acidic, make the suspension up to 100 cc., heat to boiling, and then add 2 drops of 6 *N* $NH_4OH$ solution. This should bring the *p*H value of the solution to 7 and the high temperature should tend to vaporize any excess of $NH_3$. If the *p*H value of the solution is not 7, adjust it to 7 as measured with the universal indicator. If the mixture is alkaline, add 5 cc. of HCl and then neutralize the excess acid with a slight excess of $NH_4OH$. Expel the slight excess of the latter by boiling as before, after dilution to 100 cc.

To 100 cc. of water add 0.5 gram of NaCl. After washing out the mouth thoroughly with water collect 10 cc. of saliva, add to the salt solution and heat it to 50 deg. C. Cool the water suspension of the test specimen to 50 deg. C. and add to it the salt-saliva solution. Store the mixture at 40-55 deg. C. for 1-4 hours, then remove a few fibers and test for unconverted starch with 0.02 *N* iodine solution. If a blue coloration appears, filter the main solution and digest

* This was formerly printed as two separate Standards T419-m and T420-m.
* TAPPI Standard T419m-39; Official Standard-Dec. 1926; Revised-Jan. 1930; Corrected-March 5, 1934; Revised-August 31, 1939.

the pulp with another 10 cc. of saliva as before. Test the pulp again for unconverted starch. Continue the digestions with saliva-salt solution until the pulp no longer gives a blue color with 1 solution.

*Note*—Some salivas are more active than others and therefore it may not always be necessary to use 10 cc. Some salivas may also show a slight reducing reaction with Fehling's solution. It is advisable to test the saliva for such effect; if found, run a blank test and apply the proper correction to the final test results. However, this condition will only rarely be found if the saliva is properly collected.

The second digestion with saliva is usually necessary where fairly large amounts of rosin size are used, or the paper has been overdried. If the stock has been very thoroughly beaten, or the paper overdried, the pulp, when tested after the digestion with saliva-salt solution may persistently give a faint blue color. This, however, is not a positive indication of unconverted starch, but indicates that the cellulose has attained the same iodine dispersing power as the starch. Few papers require more than two digestions with saliva.

Filter the solution through a Büchner funnel, being careful that no fibers reach the filtrate, and after sucking all the water through the funnel, wash the pulp 3 times with boiling water, draining completely after each washing. Combine all filtrates, add a few drops of HCl and concentrate to 200 cc. by evaporation on the steam bath. Transfer to an Erlenmeyer flask, add 20 cc. of HCl, fit the flask with a reflux condenser, and boil moderately for 2 hours. Cool the solution and transfer to a 250-cc. volumetric flask. After diluting to the mark and mixing, pipette 25 cc. of the solution into a 400-cc. beaker and add dry $Na_2CO_3$, slowly, and with stirring, until effervescence ceases.

To 30 cc. of Fehling Solution *A* in a 250-cc. beaker, add 30 cc. of Solution *B* and 60 cc. of water; heat to boiling, making sure no visible reduction takes place; add to the solution from the paper; boil for exactly 2 minutes, keeping the beaker covered; filter at once without dilution and determine the amount of $Cu_2O$ formed, either gravimetrically or volumetrically, as follows:

*(a)—Gravimetrically:*

Prepare a Gooch crucible with a pad of the special asbestos, approximately ¼ inch thick; wash thoroughly with water by suction to remove fine particles; wash with 10-15 cc. of alcohol, then with 10-15 cc. of ether; dry in an oven at 100-105 deg. C. for 30 minutes; cool in a desiccator, and weigh. Decant the major portion of the solution containing the precipitated $Cu_2O$ through the Gooch crucible under suction, then transfer the precipitated oxide and wash 5 times with hot water, 3 times with alcohol and then 3 times with ether. Dry the crucible and contents at 100-105 deg. C. for 30 minutes and weigh the $Cu_2O$. From the weight of $Cu_2O$, calculate the amount of dextrose according to the tables of Allihn (see Leach: "Food Inspection and Analysis" 4th Ed. p. 633; or Association of Official Agricultural Chemists: "Methods of Analysis", 1935 Ed., pp. 636-7). The calculated amount of dextrose multiplied by 0.9 gives the amount of starch in the aliquot part of the solution.

*(b)—Volumetrically:*

Filter the solution containing the $Cu_2O$ through asbestos in a small Büchner funnel and wash with about 200 cc. of hot water. Transfer the asbestos mat and the $Cu_2O$ back to the precipitation beaker, add 25 cc. of molybdophosphate solution and mix thoroughly with a glass stirring rod. Filter through the same Büchner funnel and wash thoroughly with cold water until all trace of blue color is removed. Dilute the filtrate to 400-700 cc. and titrate with *N*/30 $KMnO_4$ solution to a faint pink color after the blue color has been discharged.

1 cc. *N*/30 $KMnO_4$ = 0.0011 gram dextrose = 0.00099 gram starch.

If the titration requires less than 15 cc. of *N*/30 $KMnO_4$, the analysis should be repeated, using a 50-cc. aliquot of the prepared solution from the paper, and using 35 cc. instead of 60 cc. of added water.

*Note*—Calculation of the weight of $Cu_2O$ is not necessary if an accuracy of 0.1 to 0.2 per cent starch, dry-paper basis, is sufficient. If desired, the weight of $Cu_2O$ may be calculated from the volume of permanganate, and the tables of Allihn (see gravimetric method) may be consulted for the corresponding weight of dextrose. This may not be more accurate, however, than using the factor given, since the various kinds and grades of starch differ as to relationship to $Cu_2O$. If possible, the factor should be determined for the kind of starch contained in the paper.

REPORT

The amount of starch shall be reported as a percentage of the moisture-free paper to the nearest 0.1.

ADDITIONAL INFORMATION

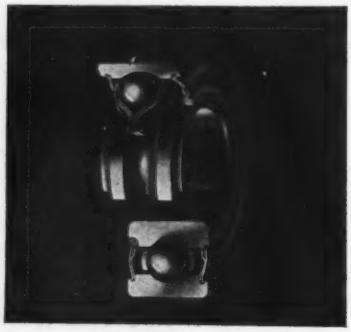
Universal Indicator: Yamada, S—Japanese pat. 99664 (Feb. 21, 1933); *Chemical Abstracts, 28*, p. 2258 (April 20, 1934); D. T. Jackson and John L. Parsons—*Tech. Assoc. Papers* p. 236 (1936).

Starch: R. C. Griffin—"Technical Methods of Analysis", 2nd Ed. p. 479, New York, McGraw-Hill Book Co., 1927.

Tottingham and Gerhardt—*Ind. Eng. Chem.*, 16, 139 (1924).

## New SKF Sealed Ball Bearings

A line of sealed ball bearings along entirely new and simple principles has just been developed by SKF Industries, Inc., Philadelphia. The seal used in these bearings is one that can be applied to bearings having a standard single row S.A.E. dimension of bore, inner and outer race width, which up to the present time has not been possible except through the use of small balls and, consequently, loss of bearing capacity.



This outstanding development has been evolved by departing from the conventional stuffing box type of seal in favor of modern air-cleaner principles sealing against dirt by the felt fibre contact on the polished surfaces of the inner race, and by the utilization of the natural tendency of deflected felt to resume its original flat shape.

Extensive tests have proved that the new seal retains the bearing lubricant and excludes any dust or dirt entry into the bearing itself, yet the sealing action is so light that the friction drag has been greatly reduced.

The bearing is, therefore, suitable over a great range of speed. Even though the bearing is in the standard single row width, which in itself simplifies design and saves space, an ample lubricant space is provided as is indicated in the photograph. It is called The SKF Red Seal Bearing, "the stop signal for dirt". Its designation is 6200 RS, and it is available for shafts up to approximately one inch in diameter.

## Technical Section Index Ready

The index to the Technical Section of the PAPER TRADE JOURNAL is available, without charge, to members of TAPPI on request. Otherwise the cost is 10 cents per copy.

# A New Method for the Determination of the Organic Matter in Acid and Alkaline Cooking Liquors*

By Herbert Prelinger[1]


## Abstract

*This paper presents a new and reliable analytical procedure of determining the organic matter in acid and alkaline cooking liquors.*

*The author establishes the need for the procedure in a discussion of the effects of the organic matter in the various cooking liquors on pulp qualities, at the same time reviewing the literature on the subject which shows considerable divergency of opinion. A simple experiment is described whereby the relative wood penetration effects of pure sulphite cooking acid uncontaminated with organic matters on the one hand and of an acid containing waste sulphite liquor on the other are demonstrated. The author holds the opinion that the relief liquor present in sulphite cooking acid displays a distinct value in increasing the degree of impregnation.*

*The principle of the proposed method for determining the organic matter in cooking liquors is the measurement of the amount of oxygen required by the organic substances for their complete oxidation to carbon dioxide and water. The oxidation of the organic matter is carried out by means of a known but excess amount of potassium iodate. After the completion of the oxidation, the excess iodate is determined and the actual oxygen consumption calculated. The organic matter content is expressed in terms of oxygen. The author has adopted the term "oxygen number" or abbreviated to "O-number" which refers to the number of milligrams of oxygen consumed by 100 cc. of the liquid under investigation.*

*Analytical procedures are given for acid as well as for alkaline cooking liquors. The practical importance of these analyses are illustrated by figures taken from actual mill operations.*


## Introduction

This paper presents a new method for the determination of the organic matter in acid and alkaline cooking liquors. The work was undertaken in an effort to establish a method for the determination of the organic matters in a direct way. To date the pulp technologist has paid little attention to the effect of the presence of organic matter in his cooking liquor, neither as regards the quantity nor the quality of it. He has therefore not been interested in its numerical determination. One reason for this might lie in the lack of a fundamentally correct and practical method. As far as could be ascertained, the literature of pulp technology contains no references to any such analytical procedure.

The method herein described is the result of intensive research and is, with only slight modifications in its procedure, applicable to the cooking liquors of all chemical pulping processes.

It is believed that the information which can result from a method of accurate determination of the organic matter furnishes a valuable, and practical, control in regard to cooking conditions and pulp quality. Under regular routine operating conditions, however, this determination needs to be carried out only occasionally in order to obtain close control.

Before discussing the principle and the procedure of the proposed method, it may be well to briefly outline the effect of the presence of organic matter in the cooking liquors upon operating conditions and the resulting pulp quality. The literature is rather sketchy on the subject of organic matter in cooking agents and contains comparatively little evidence of experimental work.

Let us first turn our attention to the sulphite cooking process. Economical operation in the sulphite process demands as complete as possible recovery of the sulphur dioxide being relieved during the cooking operation. This is ordinarily accomplished by absorbing the relief gases in the cooking acid and by partial re-use of the relief liquor. It is obvious that by the re-use of relief gases and relief liquor, a relatively high amount of organic substances, such as organic acids and carbohydrates, are introduced into the sulphite cooking acid.

The much discussed question of the action of recovered liquor on the digestion of wood is not yet clarified with full satisfaction.

The questions of fundamental interest to the pulp technologist may be briefly summarized:

Does the re-use of relief liquor (waste liquor) produce pulp of darker color?

Does the re-use of relief liquor produce pulp of lower strength quality and does it affect the yield?

Does the presence of the relief liquor at the start of the digestion process affect the mechanism of the cooking procedure?

It is not surprising to find considerable discrepancy of opinion concerning these questions. Such discrepancy is probably the natural variation in results obtained by using widely different research methods. It is a well-known fact that differences in conditions of operation frequently cause extreme differences in results. Some of these investigations were made using laboratory or semi-commercial equipment as for instance used in the work reported by G. H. Chidester *(1)* while E. Richter *(2)* carries out his research with equipment used for large-scale operation.

Chidester and his co-workers state that cooking acid containing considerable amounts of relief liquor does not show either a beneficial or a detrimental

---

* Presented by title at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.

[1] Member TAPPI, Research Chemist, Crown-Zellerbach Paper Co., Camas, Wash.

effect upon the pulp qualities. The yield, the strength qualities, and the color of the pulp produced by digestions with and without organic matter in the cooking liquor are practically comparable. He furthermore states that waste liquor can be used in the cooking acid in amounts up to nearly 100 per cent without affecting the quality of the pulp with the exception of the color. It is easy to understand that the re-use of waste liquor will produce pulp of darker color—that means a pulp of higher chlorine consumption. Chidester's results can be summarized that relief liquor as well as light colored waste liquor can be used in digesting wood without affecting the quality of the pulp.

Experimental work by E. Richter and others has given results contradictory to Chidester's findings. E. Richter found that in cases of complete re-use of the relief liquor, pulps of lower strength quality and higher copper numbers were obtained. These findings based upon actual commercial scale experiments are undoubtedly of considerable value since they represent actual operation data. Another contribution to this subject which is worthy of note is a paper by E. Haegglund and Ebbe Geijer *(3)*. The experiments described in this paper were, like Chidester's, carried out in laboratory equipment. They found that the use of normal waste sulphite liquor had no deleterious effect on the yield or quality of the pulps obtained. However, it was stated in the same article that larger amounts of cymene or turpentine when present in the waste sulphite liquor endanger considerably the stability of the cooking liquor which in turn produces a pulp of poorly cooked quality.

In another paper Haegglund *(4)* considers the carbohydrates present in the waste sulphite liquor detrimental to the stability of the sulphites which are decomposed into sulphates and free sulphur. A statement also is made that pulp produced by the use of cooking liquor containing one-third relief liquor is relatively dark in color and high in lignin.

R. Deckmann *(5)* regards the re-use of relief liquor obtained above 110 deg. C. as detrimental to pulp quality.

In reviewing the literature carefully on this subject, one must recognize that no definite conclusions can be drawn as to the effect of relief and waste liquor on pulp quality. Pulp technologists of practical experience also express contradictory opinions concerning this matter.

Passing from the sulphite process to the kraft process, we shall now consider the effect of adding black liquor in sulphate pulp cooking.

The literature on this subject is extremely sketchy probably due first, to the relatively short existence of the kraft process and second, to no apparent need for research along this line. The development of successful methods for bleaching kraft pulp necessitated research into the kraft pulping operation. Among the first to study experimentally the effect of adding black liquor in kraft pulp cooking was E. Haegglund and G. Scholling-Berg *(6)*. The experimental cooks were carried out with spruce and pine. With spruce, addition of black liquor resulted in a faster cooking at first, but the time to produce defiberable pulp was not changed in comparison to the use of straight white liquor. With pine, there was no noticeable effect upon the rate of cooking. The maximum yield of the workable pulp, the lignin content, and the strength of the pulps produced were not influenced by the addition of as much as 50 per cent of black liquor. The color of the pulp, however, was considerably darkened.

With these data at hand, the kraft pulp technologist without doubt will be interested in knowing to what extent he may add black liquor to white liquor without affecting the color of the pulp produced. No information in regard to this matter, however, is available. It is believed that each kraft mill should establish its own standards which greatly depend on the local operating conditions and special pulp requirements. On one point, however, all kraft pulp technologists undoubtedly agree that no black liquor should be used in case the pulp is cooked for the purpose of bleaching.

It will be worthwhile to go back once more to the sulphite process and reconsider the subject of relief liquor and its re-use. The composition of the relief liquor fluctuates considerably and depends largely on the cooking conditions and the wood quality. The most important constituents, are sulphurous acid, carbohydrates, and the calcium salt of the lignosulphonic acid. There are always small quantities of sulphuric, acetic, formic, oxalic and probably also citric acids present. Let us consider the mechanism of the action of bisulphite on wood. Perhaps the most outstanding and generally accepted concept of the cooking mechanism has been formulated by the hypothesis of E. Haegglund. The removal of lignin according to his theory proceeds in two phases. During the first phase the lignin of the wood combines with the sulphur of the bisulphite forming an insoluble, solid lignosulphonic acid. The first step of delignification takes place at a temperature between 70 and 90 deg. C. *(7)*.

In the second phase, the solid lignosulphonic acid is rendered soluble. The action of the first phase is pre-determined by the amount of bisulphite-ions present in the cooking liquor and by the rate of diffusion. The second phase is regulated by the acidity of the cooking liquor. Haegglund assumes that the removal of the lignin is due to hydrolysis by the free sulphurous acid. This hydrolysis is probably similar to that produced by dilute mineral acids. Acidity and bisulphite concentration determine the quality and the yield of the pulp produced. E. Haegglund *(8)* states that a high-base content in the sulphite cooking liquor increases the yield and the quality of the pulp produced. Automatically with the increase of the base, the amount of the $HSO_3$-ions decreases correspondingly. This results in a considerable reduction in the rate of diffusion of the cooking acid into the wood. The explanation for that lies in the well recognized fact that the H-ions and the $HSO_3$-ions diffuse first into the wood. The penetration of the calcium-ions is relatively much slower than that of the $HSO_3$-ions and probably starts at the moment when the solid lignosulphonic acid is formed according to the investigation by Haegglund.

For the sake of emphasis and for proper comprehension of the discussion to follow:

(1) Sulphite cooking acid high in calcium-ions produces a pulp of high quality and high in yield.

(2) Sulphite cooking acid high in calcium-ions, however, penetrates more slowly into the wood due to the lowered amount of the free $HSO_3$-ions present.

The correlation between calcium base and rate of penetration is of great practical significance to a well-controlled cooking process. The sulphite technologists agree that the manufacture of a high quality pulp

requires a rapid and complete penetration of the acid into the chips prior to the attainment of a temperature of approximately 100 deg. C. in the digester. Sulphite chemists have for some time displayed considerable interest in this subject of penetration. In the past, however, little attention has been given to the effect of the various organic constituents of the relief or waste sulphite liquor on penetration when introduced with the cooking acid into the digesting operation. A study designed to answer this question would undoubtedly be a valuable contribution to the knowledge of waste sulphite liquor in connection with its re-use in the sulphite pulping process.

The author firmly believes that organic matters in the cooking acid, resulting from waste sulphite relief liquor have some wetting abilities which in turn accelerate the rate of penetration. In any event, that waste sulphite or relief liquor possesses such a property can reasonably be presumed inasmuch as wetting agents of sulphonic derivation are known. While the effect upon penetration has not been the specific subject of research here, the author presents a simple method by which increased penetration of cooking acid containing relief liquor can be demonstrated as against pure acid, even under atmospheric conditions of pressure and temperature, that is, outside the more favorable conditions for penetration inside the digester.

Small blocks of western hemlock (Tsuga heterophylla) 1 x 1 x 4 in. carefully coated with paraffin wax except on the ends were immersed under comparable conditions in (a) pure sulphite cooking acid and (b) in cooking acid containing a normal commercial amount of waste sulphite liquor. Both acids equal in their content of total and free sulphur dioxide, analyzed 4.6 per cent total sulphur dioxide, 3.45 per cent free sulphur dioxide and 1.15 per cent combined. The paraffined wood blocks for use in determining the rate of penetration were suspended by hooks into the beakers containing the pure and waste sulphite cooking acid respectively, submerged about 2-¾ inches and allowed to remain for exactly 30 and 60 minutes respectively. Each block was then split into two identical parts and the surface of the cuts stained with bromphenol blue indicator (0.1 per cent solution). Directly upon application of the indicator solution, the entire surface of the cut was colored yellow but upon evaporation of the excess of sulphur dioxide the yellow color in the lower portion of the blocks gradually turned blue due to the presence of calcium bisulphite-ions. The area of the blue zone was indicative qualitatively of the degree of penetration of the calcium bisulphite. The photographs shown of the split and stained blocks, while demonstrating the increased rate of penetration in the case of the acid containing the waste sulphite liquor do not bring out the effect as well as was evident by visual inspection.

In the photographs the odd figures indicate the blocks submerged in the pure sulphite cooking acid; the even figures refer to the samples submerged in the waste sulphite cooking liquor and the figures numerically such as 1 and 1A represent the two halves of a same block.

In inspecting these photographs, we find at the lower ends of the blocks dark colored zones, actually blue in color, which show the height reached by the calcium bisulphite-ions. The improvement in penetration is indicated by either an increased depth or higher intensity of penetration or by both. The extent of the penetration is, therefore, illustrated by these dark colored zones which serve as the measurement for comparison.

In Fig. 1, an example of a noticeable increase in the degree of penetration is shown. The increase in this case (2 and 2A) lies definitely in a more complete saturation of the area with calcium bisulphite which is distinctly shown by the deeper coloration of the calcium bisulphite zones. The depth of penetration is practically the same for both of the two wooden blocks.

A glance at Fig. 2 will indicate one of the very few cases where no or perhaps only very little effect on penetration was observed. Extent and intensity of penetration shown in 3, 3A and 4, 4A are practically the same. This, in the author's opinion, is explained as being due to differences in the physical structure of wood. Even slight changes in the physical condition of surfaces produce different wettabilities. This fact must be recognized in all problems involving the wetting of solid surfaces according to R. N. Wenzel's *(9)* investigation.

Distinct increase of penetration is seen in Fig. 3 wherein in 6 and 6A the extent as well as the intensity of the penetration zones are found to be remarkably increased by the presence of waste sulphite liquor. Note the clear-cut edges of the penetration zone in 6 and 6A.

An even more apparent case of increased penetration is illustrated by Fig. 4. An interesting feature of this photograph is the very pronounced increase in depth of penetration (8 and 8A).

A similar observation can be made in regard to the

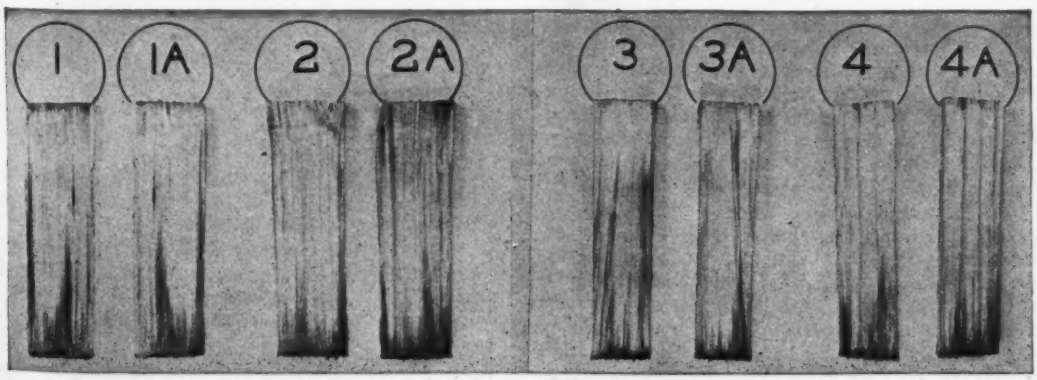



FIG. 1. FIG. 2.

**Blocks Immersed in the Acid for 30 Minutes.**

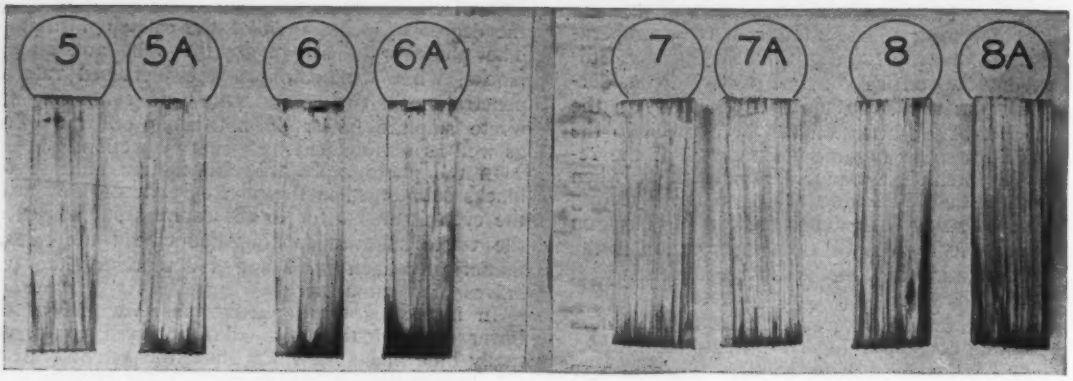



FIG. 3. FIG. 4.

**Blocks Immersed in the Acid for 60 Minutes.**

penetration of the free sulphurous acid. Here also an increase of penetration can be found with the acids containing some waste sulphite liquor. However, it is difficult to record the free acid penetration except visually, due to the high volatility of the sulphur dioxide.

This simple experimental study points definitely to the conclusion that waste sulphite liquor present in sulphite cooking acid displays distinct value in increasing the degree of impregnation.

### Principle of Proposed Analytical Method

With the background of the foregoing sections in mind, we have seen the need for a reliable method of determining the organic matter in cooking acids either for the purpose of control or for research. The term "organic matter" refers collectively to a number of organic substances which vary greatly in their chemical structure and characteristics.

Realizing this fact, it is apparent that such a method produces, and can produce, only "summative" values of the complex organic components.

The principle of the proposed method is to determine the amount of oxygen required by the organic matters for their complete oxidation to carbon dioxide and water. This reaction may be symbolized by the following equation:

$$C_n(H_2O)m + 2\,nO = nCO_2 + mH_2O$$

This method is based upon the oxidation of the organic matter by means of a known but excessive amount of potassium iodate. After the completion of the oxidation, the excessive amount of potassium iodate is determined and the actual oxygen consumption calculated.

It is obvious that the amount of oxygen consumed is in direct relation to the amount of the organic matters present and serves for their measurement. The organic substances, therefore are expressed in terms of oxygen. The author has adopted the term "oxygen number" or abbreviated to "O-number" which value refers to the number of milligrams of oxygen consumed by 100 cc. of the liquid under investigation.

Recently the author *(10)* described the investigation designed to ascertain the chemical soundness of the method proposed. The present paper constitutes part of a similar but separate investigation concerning the determination of organic matter in various types of cooking liquor. All these methods, though based on the same fundamental principle, require modifications in procedure before they can be applied satisfactorily to the different liquors. The results obtained by these methods of analysis are expressed in terms of oxygen. The adaptability and the usefulness of these methods were found to be most practical and satisfactory for control as well as research work. The form of expressing the results in terms of oxygen is convenient and can successfully be used in practical as well as in scientific evaluation.

This investigation dealing with the determination of organic matter, it is hoped, presents a real contribution to the analytical methods in the field of pulp chemistry. The organic matters, the "summation" of its components, can now be measured and expressed in exact terms.

### Method of Analysis

The method proposed for the determination of the organic matter in the various cooking liquors is accurate, simple to perform and does not require any special equipment.

*Reagents and Equipment Required:*

N/10 sodium thiosulphate solution.
Potassium iodate solution (approximately 27 grs. per liter)
Sulphuric acid (1:1)
Sodium hydroxide solution, approximately 15 grs. in 50 cc. of water.
Titanium sulphate (approximately 1 per cent solution)
Starch solution
Pyrex test tubes capacity 80 cc.
Volumetric flasks, 25 and 100 cc. capacity

*Standardizing of Potassium Iodate Solution:*

Pipette 2 cc. of iodate solution into a flask, add 20 cc, of water, 2 cc. of sulphuric acid and a few crystals of potassium iodide. The liberated iodine is titrated with N/10 sodium thiosulphate as usual.

One cc. N/10 $Na_2S_2O_3$ = 0.003567 grs. $KIO_3$

*Preparation of Titanium Sulphate Indicator Solution:*

Place 1 g. of titanium dioxide in a 200 cc. beaker, add 10 g. of sodium sulphate and 40 cc. of concentrated sulphuric acid, and heat on hot plate for approximately ½ hour. The solution should attain a temperature of about 335 deg. C. Cool, add water to make volume up to about 100 cc. and filter when necessary.

(A.) EXPERIMENTAL PROCEDURE FOR SULPHITE COOKING ACID.

(1) 20 cc. of the cooking acid to be analyzed are pipetted into a 25-cc. volumetric flask.

(2) Add 1.7 to 2.2 cc. of the 30 per cent hydrogen peroxide solution. This is done for the purpose of oxidizing the sulphites and sulphurous acid to sulphates and sulphuric acid respectively. The thiosulphates form tetrathionates initially, then the reac-

tion becomes more complicated, finally forming sulphates in presence of free alkali. Organic matters are not affected by the oxidizing agent under the conditions described. The amount of hydrogen peroxide added depends on the strength of the cooking acid. By the addition of hydrogen peroxide a heavy precipitate of $CaSO_4$ is formed which settles quickly to the bottom of the flask. Heating the solution is not necessary since the reaction proceeds exothermically. After the action has ceased (shown by quick settling), test for the presence of excess of hydrogen peroxide in order to be certain that a complete oxidation took place. Use spot test for excess of hydrogen peroxide. Place one drop of the liquid to be tested in a spot plate and add 2 drops of the titanium solution which reacts with the hydrogen peroxide to form the yellow pertitanic acid.

(3) Make volume up to 25 cc. with distilled water; cool to room temperature, mix thoroughly, and allow to settle for several minutes. Then filter through a dry filter paper.

(4) Pipette 5 cc. of the clear filtrate, which corresponds to 4 cc. of the original acid sample, into a 100-cc. volumetric flask. Add some distilled water, make distinctly alkaline with potassium hydroxide, and place flask in a boiling water bath and allow it to remain until complete decomposition of the excess of hydrogen peroxide takes place. This is accomplished in the time of 10 to 20 minutes. Test for absence of hydrogen peroxide with titanium sulphate. Use a large beaker as a water bath in which a grid of wire is placed just above the bottom of the beaker in order to avoid bumping.

(5) After cooling, acidify with sulphuric acid, fill to the mark with distilled water, and mix thoroughly.

(6) Pipette 10 cc. of this liquid into a large test tube, add 2 cc. of potassium iodate solution (quantity depends on strength of cooking acid), 2 cc. of sulphuric acid (1:1), and mix content thoroughly by careful shaking. Potassium iodate always must be added in excess.

(7) Place test tube again in the boiling water bath equipped with the wire grid and evaporate water in test tube.

(8) After evaporation, place test tube in bath of phosphoric acid which was previously heated to about 170 deg. C. Keep sample in bath for 15 to 20 minutes at this temperature.

(9) After cooling the sample, add approximately 10 to 15 cc. of water and place test tube again, after careful mixing, in the boiling water both. The mixture is boiled until all of the liberated iodine has been expelled.

(10) To the cooled solution a few crystals of potassium iodide are added and the liberated iodine, corresponding to the excess of iodate in the solution, is finally titrated with N/10 thiosulphate.

*Calculation:*

The cc. N/10 $Na_2S_2O_3$ (a), used for standardizing 2 cc. of potassium iodate solution, minus cc. N/10 $Na_2S_2O_3$ (b), required in the back titration, represents a difference which is due to the amount of potassium iodate required for the oxidation of the organic substances.

$$\frac{\text{One cc N/10 } Na_2S_2O_3 = 0.003567 \text{ grs. } KIO_3 \text{ or } 0.0008 \text{ g. oxygen}}{(a-b) \times 0.0008 \times 100 \times 1000} = \frac{\text{oxygen number of the sulphite cooking acid}}{0.4}$$

The method has been tested upon samples of wide range in their content of organic matter. The O-number of sulphite cooking acid was found to fluctuate from 250 to 1850 units.

(B) Experimental Procedure for Waste Sulphite Liquor

(1) One cc. of the waste sulphite liquor to be tested is pipetted into a 100-cc. volumetric flask. Add 20 cc. of water and a few drops of hydrogen peroxide (30 per cent) whereby the faint yellow color is changed to brown violet. Test for the presence of an excess of hydrogen peroxide.

(2) Add a few cc. of sodium hydroxide solution in order to make solution strongly alkaline. The color of sample changes again to a bright yellow.

(3) Place flask in a boiling water bath and allow it to remain until complete decomposition of the excess of hydrogen peroxide takes place. Test for absence of hydrogen peroxide.

(4) When the test has been found to be negative, cool sample to room temperature, acidify with sulphuric acid, and fill up to the mark with distilled water. Mix thoroughly.

(5) Pipette 5 cc. of the liquid, which corresponds to 0.05 cc. of the original sample of waste sulphite liquor, into a large test tube, add 5 cc. of potassium iodate solution, 2 cc. of sulphuric acid (1:1), and mix contents thoroughly by careful shaking. Potassium iodate always must be added in excess. The sample is now ready to be evaporated using a water bath.

(6) The procedure to follow is identical to that described under (A) sulphite cooking acid. Continue according to the description in paragraph 7.

*Calculation:*

The cc N/10 $Na_2S_2O_3$(a), used for standardizing 2 cc. of potassium iodate solution, minus cc. N/10 $Na_2S_2O_3$(b), required in the back titration, represents a difference which is due to the amount of potassium iodate required for the oxidation of the organic substances.

$$\frac{\text{One cc N/10 } Na_2S_2O_3 = 0.003567 \text{ grs. } KIO_3 \text{ or } 0.0008 \text{ g. oxygen}}{(a-b) \times 0.0008 \times 100 \times 1000} = \frac{\text{oxygen number of the waste sulphite liquor}}{0.5}$$

Several samples of waste sulphite liquor were tested for their characteristic O-numbers. They were found to fluctuate from 14,000 to 17,000.

The usefulness of the O-number in determining the composition of effluents is also obvious.

(C) Experimental Procedure for Kraft Black Liquor

(1) Pipette 1 cc. of the black liquor to be analyzed into a 100-cc. volumetric flask. (In case of very accurate analysis weigh sample.) Fill flask up to the mark with distilled water and mix thoroughly.

(2) Pipette 10 cc. of this liquid into another 100-cc. volumetric flask, add 20 cc. water, and acidify with sulphuric acid in order to decompose the sulphur compounds. The major part of the organic substances is thereby precipitated.

(4) Heat in boiling water bath for about half an hour in order to expel $H_2S$ and $SO_2$ gases.

(5) Cool, add several cc. of a strong solution of sodium hydroxide until liquid shows distinct alkaline reaction. The precipitate of organic substances is thus rendered soluble again.

(6) Add several drops of hydrogen peroxide (30 per cent) in order to oxidize remaining amounts of

sulphur compounds to sulphates. Test for presence of excess hydrogen peroxide.

(7) Place flask in boiling water bath and boil off the excess hydrogen peroxide. Test for absence of hydrogen peroxide.

(8) Cool sample and fill flask to the mark with distilled water.

(9) Pipette 10 cc. of this solution, which corresponds to 0.01 cc. of the original liquor, into a large test tube, add 5 cc. of potassium iodate solution, 3 cc. of sulphuric acid (1:1), and mix content thoroughly by careful shaking. The sample is now ready to be evaporated using a water bath.

(10) The procedure to follow is identical to that described under (A) sulphite cooking acid.

Continue according to the description in paragraph 7, under A.

*Calculation:*

The cc N/10 $Na_2S_2O_3$(a), used for standardizing 5 cc. of potassium iodate solution, minus cc. N/10 $Na_2S_2O_3$(b), required in the back titration, represents a difference which is due to the amount of potassium iodate required for the oxidation of the organic substances.

$$\frac{\text{One cc N/10 } Na_2S_2O_3 = 0.0003567 \text{ grs. } KIO_3 \text{ or } 0.0008 \text{ g. oxygen}}{\dfrac{(a-b) \times 0.0008 \times 100 \times 1000}{0.01} = \text{oxygen number of kraft black liquor}}$$

Several O-number determinations performed with black liquor of 12 degrees Be, have shown a range from 10,000 to 16,000 units.

### Literature Cited

(1) G. H. Chidester, C. E. Hrubesky and J. N. McGovern, *Paper Trade J.* 93, No. 21: 42-46; (Nov. 19, 1931).
(2) E. Richter, *Zellstoff u. Papier* 13, No. 12: 560-563 (Dec. 1933).
(3) E. Haegglund and Ebbe Geijer, *Zellstoff u. Papier* 14, 490-492 (1934).
(4) E. Haegglund, *Papier-Fabr.* 26, (43) 657-61 (1928).
(5) R. Dieckmann, Die Fabrikation des Zellstoff aus Holz. p. 206-207 Elsner Berlin, (1923).
(6) E. Haegglund and G. Schollin-Borg, *Papier-Fabr.* 30, 359-63 (1932).
(7) E. Haegglund, A. Ekwall and J. Hostomsky; *Wochenblatt f. Papierfabr.* 63, 26-30 (1932).
(8) E. Haegglund, *Svenske Pappers Tid* 34, 160-9 (1931).
(9) R. N. Wenzel, *Ind. Eng. Chem.* 28, No. 8, 988-994 (Aug. 1936).
(10) H. Prelinger, *Paper Trade J.* 107, No. 11: 81-86 (Sept. 15, 1938).

# Some Speculations on Fundamentals in Refining*

By A. S. Cosler[1]

Stock preparation is one of the most definite terms and most talked of operations in paper making today; while refining, is perhaps one of the most indefinite. Trade usage however has established the latter's meaning to cover any operation from defibering of multiple fiber aggregates to the final phase of stock preparation. In support of this, witness the use for many years past of groundwood screenings refining; or prebleaching refining of twelve or so years ago; or its application 30 years ago *(1)* to the final stages of stock preparation when a Jordan engine was called a refining engine. Without taking any position on what refining should mean, or what machine should be called a refiner, the broad meaning established by trade usage up to this time is adopted for this article.

There have been many attempts to establish the best means of refining some particular stock for some particular paper product. Often these attempts have been termed fundamental researches and in some cases at least, the term fundamental has been used to indicate the thoroughness with which the work was done and the exactitude with which values were determined, rather than the fact that the research was concerned with anything definitely fundamental in refining. The refining operation brings about several changes in the physical form and condition of fibers. These separate, immediate effects which are produced on the fiber by the application of force, are the fundamentals of refining in a very special sense. They are basic elements in the study of refining, but have never been discussed as a group for and by themselves and this short article attempts to direct attention to them, to their relationship, and to their importance, without attempting to evaluate them. At least four typical mechanical effects can be and are produced on fiber, and they may be described as follows:

1. Fibers can be cut clean. Coniferous fibers have lengths 100 times their diameters and they could be cut many times.
2. Fibers can be torn apart so that fibrillae and lamellae are developed and these can either stay attached to the fiber, which is the state usually meant by fibrillation, or they can be detached from the fiber in the form of fines or debris.
3. Fibers can be crushed to destruction either by straight mechanical pressure or sliding motion of bars.
4. Fibers can be pliabilized while maintaining their physical form intact. This pliabilization can come from high turbulence *(2)* or mechanical rolling between surfaces, as a match is made pliable when rolled between floor and shoe, without destroying its form.

Hydration is a fifth effect produced whenever force is applied to the fiber, but it is not enumerated with the four above because it is not known to be and is not generally conceded to be a simple mechanical effect. The term is used by both the technical and practical men of the industry to cover a wide variety of effects. In this discussion the term hydration always means that effect which, if developed far enough, will produce greaseproofness and give the blister test in paper. It seems to be always a concommitant of mechanical action on fiber. It always seems to accompany the application of force to fiber, although in some operations like clean cutting the hydration effect may be negligible. Whether it is a chemical or a physical phenomenon is not of interest here. The important thing is the relation it actually bears to the four enumerated mechanical effects in producing properties it alone is now often

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.
[1] Technical Director, The Bauer Bros. Co., Springfield, Ohio.

supposed to produce in the thousands of grades of papers and boards made in the paper industry today.

These four admittedly mechanical effects enumerated above, have been generally understood to be brought about by the working elements within a refiner. Fiber demolition as it occurs in 1, 2, and 3, (all but pliabilization), is more particularly due to the direct contact action of refining equipment with fiber; i.e. the jordan bars, beater bars, refiner bars, or discs or plates. The fourth mechanical effect, however,—pliabilization of the fibers, may be the result of rolling action or the result of turbulence within the refining apparatus; i.e. jordans, beaters, high speed cone refiners, disc refiners and the jet and target refiner. Naturally turbulence is very much more a factor in machines where there is a high velocity change of direction in the flow of stock, than in those machines where the motion of the stock is sluggish. Hence, the turbulence effect would be at a minimum relatively in a beater and at a maximum relatively in disc refiners.

Some have mistakenly concluded that the power which is absorbed in producing motion in the fluid stock mixtures in beaters, jordans, high speed cone refiners, and disc refiners is wasted, but this power produces some effect by fiber to fiber friction and by turbulence. Fiber to fiber friction has perhaps been given more than its deserved credit for fiber effect. A handful of 6 per cent stock from the beater seems quite firm, but, even so, the fiber swollen as it is, occupies less than 6 per cent of the volume and water more than 94 per cent. Magnify that suspension until the fibers are the size of chalk line, say 1/16 inch diameter by 7 inches long, and they will be about ¼ inch apart and contact with other fibers at only a few places in their length. When the stock mixture rolls on itself there is some fiber to fiber friction. The fibers however do not come closer together under fluid pressure as is sometimes thought, for water is practically incompressible and the spatial relations of fibers remain the same whether the mixture is under no pressure or under a thousand pounds to the inch, so the fiber to fiber friction effect is limited even under pressure conditions.

### Effect of Turbulence

Turbulence however is a great factor in modern stock preparation as pointed out by this writer before this association in February, 1936 *(2)* as follows—"the results in this double disc machine depend on what happens to the stock between the discs and not (on) what the discs do to the stock", and later "the valleys and ridges (of the plates) passing each other at 22,000 f.p.m., set up violent vortex actions that have much to do with the result" *(3)*. When turbulence is produced in any refining equipment, there is some fiber to fiber friction effect to be sure, but the greater factor seems to be the drastic working of the fiber as it follows the vortex whirls. These are of very small diameter and high velocity and the fiber is thus bent, or practically doubled over on itself, almost instantaneously many times. Such action is equivalent to pulling each individual fiber over a sharp edge at high velocity and thus upsetting its internal structure. By examination of our plates we have found unmistakable evidence that these vortices whirl at speeds above 12,000 ft. per minute and within diameters of 1/16 inch or less.

It is comparatively simple to determine which type of standard refining apparatus—beater, jordan, disc, etc., will prepare a given stock for a known present sheet with the least power and at the lowest cost. Even here, however, we fail to reach our real objective for we do not know what type of mechanical action will produce each of the five given effects most efficiently. Tests indicate possible power consumptions much lower than any so far discussed in the literature, but what such a commercial machine will do is still unknown. It is a fact not very frequently taken into account that there may be several mechanical agencies for producing one certain type of fiber demolition, like crushing to destruction, and that the one taking the least power might still be operating with the least overall efficiency. That particular machine might be attacking the problem in the easiest way and yet might not be approaching its ideal power requirements as closely as the others. Likewise, it may not be easy to recognize that the present type of refining unit most nearly approaching the desired type of total stock preparation in one operation, might be far from the units used if the separate actions desired on the fiber were isolated and produced in different machines. Nevertheless, even though we are at the moment confined to determining the most effective rather than the most efficient means of producing our desired results, the relative ratings can be worked out.

Very little work has been done to determine what types of mechanical action will produce any of the above specific refining effects with the least power. Take the operation of crushing the fiber to destruction, (number 3 above for example). This is most often done now in the beater and jordan as in the production of greaseproof, where a mixture of well beaten, (hydrated in this case), shortened, and pliabilized fiber, mixed with a large amount of fiber debris, seems to be the needed mixture for giving the properties of a greaseproof sheet as at present made. There is no question but that the power used in direct friction cone to shell, or roll to bed plate is wasted, even though it is needed to get those members close enough together to do the necessary work. We appreciate the beater and Jordan highly and know they are now the main stock preparation equipment of the world; but the direct friction between the moving parts is an inherent and serious power loss. Other types of apparatus for producing this fiber demolition may eliminate this type of power loss almost entirely and perhaps in addition may accomplish the fiber crushing itself with less power absorption.

### Analogy to Wood Grinder

While wood grinding is not included in refining or stock preparation, it is similar in many respects, for fibers are not only separated but they are fibrillated, torn apart and destroyed. The development of increased area is more extensive in wood grinding than even in the most prolonged beating. Hence we can consider the analysis of the power applied to a grinder as somewhat comparable to the analysis of a power balance in a refining operation. There have been some serious attempts to get at the actual efficiency of the wood grinding operation. According to one view, pulp grinders have a very low efficiency, perhaps 2 per cent or less, because practically all

the power put into the machine can be accounted for by heat energy carried from or dispelled from it.

The contention that all heat produced represents friction which of necessity must be waste energy, seems to disregard the fact that the kinetic energy applied to the grinder shaft must come from the grinder as kinetic, potential, chemical, electric, or heat energy. The pulp mass carries no derived potential or kinetic energy from the grinder. It might carry a little derived chemical energy due to hydration changes; it might carry a little derived electrical energy due to surface charges on the greatly extended surface area. That leaves heat as practically the only form of energy derived in and carried from the grinder. This heat is all derived from friction within the machine but this friction does not necessarily represent waste energy. Friction is the only means by which the grit of the stone can hold the fiber which it tears from the log. This tearing from the log is overcoming frictional resistance from the first microscopic movement of the fiber until the last clinging threads are parted. It may continue to be held by the grit and be dragged across the face of the log by the stone. What started perhaps as a fiber bundle is reduced to ultimate fiber, may be pliabilized, fibrillated, or disrupted and reduced entirely to fiber debris. This regrinding action (sometimes avoided as much as possible), is produced altogether by friction, and while it is not the most efficiently applied force, it does produce its mechanical effect of fiber demolition always apparent in stone grinder stock. We are not forgetting the fact that making ground wood pulp is not stock preparation or refining, but during the production of ground wood much of the power is expended on those stages of fiber subdivision that might be accomplished in a second stage called refining and ground wood as now made and used does not need further refining.

The idea developed above that the forces are not most efficiently used applies to all refiners as well as to pulp grinders. In attempts so far to determine the most effective (efficient) machine to prepare a given stock, it has usually been the practice to record the power required to make a certain strength of sheet, or to attain some other desired physical requirement and in this practice two variables have often been disregarded. One variable is the spread between the raw stock test and the finished product test. The other variable is the essentially different amount of power that will be required to develop each unit in those different spreads. To illustrate, we wish to make a bag stock, 95-100 mullen, good tensile and high tear being special requirements; formation, porosity, etc. being neglible. One mill may start with a stock that tests 50 mullen and has to develop 45 pts. mullen to reach its standard. Another mill starts with a raw stock testing 40 mullen and has to develop 55 pts. mullen. This 22 per cent more mullen boost does not tell the whole story of power difference required because it takes more power usually to develop a point mullen on the pulp originally testing 40 than it does to develop a point mullen on the stock originally testing 50. The power required may be much more than the indicated 22 per cent difference, in fact might more nearly approach 48 per cent which is the per cent of per cent difference. Instead of talking about the power required for a complete property change, the writer, therefore, has been using a unit called "points mullen developed per h.p. day per ton", or "points freeness drop", or "points tensile gain", or "points tear rise or drop". Some people would rather use "h.p.-hour" than "h.p.-day" and this unit is just as logical, though not as easily related to practical mill operation.

### Degree of Hydration

It is evident that any study of the basic effects produced on fibers during the refining or stock preparation operation, would be vastly advanced if we could discover a means of indicating the development of hydration as such. We have tried to utilize the deeper shade assumed by a beaten fiber with special dyes, using various dye concentrations to grade from lightest tints up to heavy tints, but no method or mordant has yet shown promise. If we could get some method of determining even roughly the degree of hydration, it would enable us to differentiate its effect, and thus separately study pliabilization, and fibrillation—as they effect mullen, tensile, tear, fold, and all the other properties they may control or effect. Even without this means of differentiating hydration however, the study of the four specific mechanical effects above will probably give us a great deal of information about the nature of and development of hydration itself.

Each of the machines used for refining today produces in some measure all five effects simultaneously, and the proportion between them is not controllable or at least not susceptible of variation at will. Experimental machines can be developed to produce each of the named effects separately in a high degree and with very little of the other effects being present. With these we could learn the contribution of each effect to the large number of properties we know as a finished sheet of paper or board. To talk of building machines that will produce the five different effects as nearly separately as possible, so those effects can be combined at will in various proportions, may seem a long way from helping the paper mill technician or superintendent who today wishes to reduce his refining power or improve his refining quality. Yet, because of the great number of refining engines now on the market and the resulting confusion as to claims and capabilities, this suggested course may be the shortest road to any real solution.

### Broad Field of Research Opened

It can, therefore, be seen that there is a broad field of research opened into the relative and individual contribution of each of the four mechanical effects mentioned, (plus hydration) to this general thing we call stock preparation or refining. Such fundamental research would not only lead to better and cheaper stock preparation, but, beyond question, would lead to the preparation of stock that will give new combinations of desirable paper qualities not yet attained. These new combinations of properties would extend the uses of paper and board into new fields and hence develop demand for paper and pulp. New uses for paper is the great problem before the industry today and this method of developing grades and products with new properties, should open new tonnage demand quicker than the further extension of our established grades to other uses.

### Literature Cited

(1) *Paper Trade J.* (April 16, 1909).
(2) *Tech. Assoc. Papers,* XIX: 282-283 (1936).

# Imports of Paper and Paper Stock

## Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

### NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

SUMMARY

Cigarette paper .....448 cs.
Wall paper .....1 ble., 21 cs.
Paper hangings .....8 bls., 3 cs.
Newsprint .....11,005 rolls, 38 bls.
Printing paper .....184 rolls, 26 bls.
Wrapping paper .....21 bls.
Filter paper .....17 cs.
Tracing cloth .....2 cs.
Surface coated paper .....16 cs.
Transfer pictures .....6 cs.
Decalcomanias .....14 cs.
Decalcomania paper .....25 cs.
Tissue paper .....2 cs.
Fancy paper .....1 cs.
Pattern paper .....1 cs.
Writing paper .....1 cs.
Paper tubes .....89 ctns., 28 cs.
Card board .....4 cs.
Tinfoil backed paper .....21 cs.
Miscellaneous paper ....315 pkgs., 313 ctns., 1050 rolls, 66 cs.

CIGARETTE PAPER

American Tobacco Co., *De Grasse,* Havre, 275 cs.
De Mauduit Paper Corp., *Normandie,* Havre, 2 cs.
Picciotto, Inc., *Normandie,* Havre, 3 cs.
De Mauduit Paper Corp., *Washington,* Havre, 168 cs.

WALL PAPER

——, *Georgic,* London, 1 ble.
——, *Bremen,* Bremen, 1 cs.
Titan Shipping Co., *Washington,* Havre, 12 cs.
F. Blank & Co., *Washington,* Havre, 8 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Farmer,* London, 8 bls., 3 cs.

NEWSPRINT

News Syndicate Co., *Brand,* Comeau Bay, 6836 rolls.
H. G. Craig Co., Inc., *Donpaco,* Donnacona, 313 rolls.
——, *Stavangerfjord,* Oslo, 838 rolls.
International Paper Co., *G. T. D.,* Gatineau, 397 rolls.
——, *Transylvania,* Glasgow, 156 rolls.
International Paper Co., *G. D. D.,* Gatineau, 300 rolls.
Parsons & Whittemore, Inc., *Collamer,* Havre, 101 rolls.
Nolan Bowmall & Co., Inc., *Gripsholm,* Gothenburg, 96 rolls.
International Paper Sales Co., *International No. 1,* Gatineau, 327 rolls.
H. Reeve Angel & Co., Inc., *Mormacport,* Kotka, 453 rolls.
Lunham & Reeve, Inc., *Mormacport,* Kotka, 265 rolls.
Jay Madden Corp., *Washington,* Finland, 38 bls., 554 rolls.
H. G. Craig Co., Inc., *Kermic,* Donnacona, 369 rolls.

PRINTING PAPER

General Motors Overseas Operations, *Bremen,* Bremen, 184 rolls.
Walker Goulard Plehn Co., Inc., *Mormacport,* Kotka, 26 bls.

WRAPPING PAPER

——, *Gripsholm,* Gothenburg, 21 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Farmer,* London, 17 cs.

TRACING CLOTH

A. Field & Co., Inc., *Franconia,* Liverpool, 2 cs.

SURFACE COATED PAPER

Gevaert Co., of American, *Black Eagle,* Antwerp, 16 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Bremen,* Bremen, 6 cs.

DECALCOMANIA

General Motors Overseas Operations, *Bremen,* Bremen, 14 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Franconia,* Liverpool, 25 cs., (duplex).

TISSUE PAPER

W. J. Byrnes & Co., *Aquitania,* Southampton, 2 cs. (coated).

FANCY PAPER

C. A. Haynes & Co., *Aquitania,* Southampton, 1 cs.

PATTERN PAPER

The Stevens Nelson Paper Corp., *American Farmer,* London, 1 cs.

WRITING PAPER

H. W. Robinson & Co., *Washington,* Havre, 1 cs.

PAPER TUBES

——, *Bremen,* Bremen, 89 ctns, 28 cs.

CARD BOARD

Massce & Co., *Normandie,* Havre, 4 cs.

TINFOIL BACKED PAPER

——, *Aquitania,* Southampton, 21 cs.

MISCELLANEOUS PAPER

H. W. Robinson & Co., *De Grasse,* Havre, 4 cs.
——, *Stavangerfjord,* Gothenburg, 120 rolls.
Lansen Naeve Corp., *Normandie,* Havre, 17 cs.
Rohner Gehrig & Co., *Normandie,* Havre, 2 cs., 313 ctns.
——, *Gripsholm,* Gothenburg, 930 rolls.
The Borregaard Co., Inc., *Gripsholm,* Gothenburg, 315 pkgs.
Japan Paper Co., *Gertrude Maersk,* Kobe, 43 cs.

RAGS, BAGGINGS, ETC.

——, *Zaandam,* Rotterdam, 367 bls. fustians.
——, *Alex van Opstal,* Antwerp, 286 bls. cotton waste.
Loumar Textile By Products, Inc., *Black Condor,* Antwerp, 55 bls. bagging.
Chase National Bank, *Franconia,* Liverpool, 64 bls. bagging, 71 bls. rags.
E. J. Keller Co., Inc., *Collamer,* ——, 42 bls. rags.
R. Blank, *Collamer,* Havre, 187 bls. rags.
D. S. Stern Corp., *Pr. Garfield,* Bombay, 100 bls. cotton waste.
Manufacturers Trust Co., *Pr. Overfield,* Bombay, 100 bls. cotton waste.
Padawer & Co., *Pr. Garfield,* Bombay, 100 bls. cotton waste.
——, *Black Hawk,* Rotterdam, 65 bls. bagging.
Chase National Bank, *Black Hawk,* Rotterdam, 101 bls. bagging.
National City Bank, *Black Hawk,* Rotterdam, 68 bls. rags.
American Express Co., *Black Hawk,* Rotterdam, 191 bls. rags.
Chase National Bank, *Dunelmia,* Novorossisk, 5503 bls. cotton linters.
Chase National Bank, *Dunelmia,* Novorossisk, 13 bls. silk waste.
E. J. Keller Co., Inc., *Washington,* ——, 294 bls. rags.

OLD ROPE

National City Bank, *American Farmer,* London, 66 coils.

CASEIN

National City Bank, *Scanmail,* Buenos Aires, 417 bags.
American Cyan. & Chemical Co., *Scanmail,* Buenos Aires, 1400 bags.
American & British Chemical Supplies, *Scanmail,* Buenos Aires, 500 bags.
G. H. Hammond Co., *Southern Prince,* Buenos Aires, 406 bags.

WOOD PULP

Atterbury Bros., Inc., *Stavangerfjord,* Oslo, 1200 bls. bleached sulphite.
The Borregaard Co., Inc., *Stavangerfjord,* Sarpsborg, 654 bls. unbleached sulphite.
Chase National Bank, *Stavangerfjord,* Oslo, 912 bls. bleached sulphite.
——, *Stavangerfjord,* Drammen, 375 bls. dry sulphite.
M. Sone, *Executive,* Constanza, 375 bls. bleached sulphite, 75 tons.
J. Andersen & Co., *Mormacport,* Stockholm, 150 bls. dry sulphite, 25 tons.
Bulkley Dunton Pulp Co., Inc., *Mormacport,* Stockholm, 1290 bls. dry sulphite, 217 tons.
Castle & Overton, Inc., *Mormacport,* Wiborg, 797 bls. bleached wood pulp, 157 tons.
——, *Uddleholm,* Wallvik, 162 bls. dry sulphate, 750 bls. dry sulphite.

———, *Wanja,* Gefle, 500 bls. dry sulphite, 100 tons.
Perkins Goodwin & Co., *Wanja,* Sundsvall, 150 bls. dry sulphite, 25 tons; 180 bls. dry sulphate, 30 tons.
Bank of N. Y. Trust Co., *Wanja,* Hernosand, 1752 bls. dry sulphite, 292 tons.
E. M. Sergeant Pulp & Chemical Co., Inc., *Wanja,* Hernosand, 750 bls. dry sulphite, 125 tons.
———, *Wanja,* Hernosand, 1140 bls. dry sulphite, 190 tons.
Price & Pierce, Ltd., *Alsund,* ———, 250 bls. unbleached mechanical pulp, 162 bls. unbleached sulphate, 750 bls. unbleached sulphite, 270 bls. bleached sulphate.

WOOD PULP BOARDS

H. Fuchs & Son, *Gripsholm,* Gothenburg, 25 crates.
Fiber Case & Novelty Co., *Gripsholm,* Gothenburg, 21 bls.
Jay Madden Corp., *Mormacport,* Wiborg, 107 bls.
Jay Madden Corp., *Mormacport,* Kotka, 98 rolls, 27 bls.

## NEWARK IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 390 rolls newsprint.
———, *Uddeholm,* Kopmanholmen, 270 bls. dry chemical pulp.
Pagel Horton & Co., Inc., *Uddeholm,* Kopmanholmen, 306 bls. dry sulphite.
Pulp Sales Corp., *Uddeholm,* Kemi, 9100 bls. sulphate.
Stora Kopparberg Corp., *Uddeholm,* Skutskar, 540 bls. dry pulp.

## ALBANY IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

Gottesman & Co., Inc., *Wanja,* Sundsvall, 2340 bls. sulphite, 395 tons.
Pagel Horton & Co., Inc., *Wanja,* Gefle, 1500 bls. sulphate, 300 tons; 6950 bls. dry sulphite, 895 tons.
———, *Wanja,* Gefle, 2250 bls. dry sulphite, 457 tons.
Tradesman's National Bank Trust Co., *Wanja,* Norrsundet, 2125 bls. dry bleached sulphate, 488 tons.
Perkins Goodwin & Co., *Wanja,* Sundsvall, 1200 bls. dry sulphite, 200 tons.
———, *Wanja,* Hernosand, 600 bls. dry sulphite, 100 tons.

## PORTLAND IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

Price & Pierce, Ltd., *Blankaholm,* ———, 1650 bls. unbleached sulphate, 1200 bls. bleached sulphate.
Pagel Horton & Co., Inc., *Blankaholm,* Sweden, 4987 bls. wood pulp.

## BOSTON IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

———, *Livenza,* Algiers, 80 bls. rags.
D. C. Andrews & Co., *Black Condor,* Antwerp, 16 bls. cotton waste.
American Express Co., *Black Condor,* Antwerp, 130 rolls wrapping paper.
———, *Colamer,* Havre, 34 rolls newsprint.
Irving Trust Co., *Collamer,* Havre, 53 bls. rags.
T. D. Downing & Co., *Collamer,* Havre, 4cs. writing paper.
———, *Colamer,* Dunkirk, 45 bls. rags.
Irving Trust Co., *Collamer,* Dunkirk, 77 bls. bagging.
Darmstadt Scott & Courtney, *Collamer,* Dunkirk, 63 bags pickers.
Price & Pierce, Ltd., *Uddeholm,* ———, 3000 bls. unbleached sulphite, 1200 bls. unbleached sulphate.
Pagel Horton & Co., Inc., *Blankaholm,* Sweden, 306 bls. wood pulp.

## PHILADELPHIA IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

E. J. Keller Co., Inc., *Zaandam,* ———, 52 bls. rags.
———, *Toronto City,* Bristol, 60 coils old rope.
E. J. Keller Co., Inc., *Executive,* ———, 358 bls. rags
Castle & Overton, Inc., *Collamer,* Havre, 94 bls. rags.
E. J. Keller Co., Inc., *Collamer,* ———, 163 bls. rags.
National City Bank, *Scanmail,* Buenos Aires, 250 bags casein.
Pulp Sales Corp., *Mormacport,* Helsingfors, 130 bls. dry mechanically ground pulp.
Jay Madden Corp., *Mormacport,* Helsingfors, 16 bls. wrapping paper.
Jay Madden Corp., *Mormacport,* Wiborg, 89 bls. wood pulp boards.
Pulp Sales Corp., *Mormacport,* Wiborg, 305 bls. sulphite, 61 tons, 262 bls. sulphate, 52 tons.
Pulp Sales Corp., *Mormacport,* Kotka, 457 bls. mechanically ground pulp, 91 tons.
J. W. Hampton, Jr. & Co., *Mormacport,* Kotka, 27 bls. 111 rolls printing paper.

## BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

American Express Co., *Black Hawk,* Antwerp, 4 cs. stencil paper.
Bulkley Dunton Pulp Co., Inc., *Mormacport,* ———, 210 bls. dry sulphite, 35 tons.
Pulp Sales Corp., *Mormacport,* Helsingfors, 520 bls. mechanically ground pulp, 104 tons.
Pulp Sales Corp., *Mormacport,* Wiborg, 186 bls. bleached sulphite, 37 tons.
Castle & Overton, Inc., *Mormacport,* Wiborg, 843 bls. unbleached wood pulp, 167 tons.
Whitaker Paper Co., *Mormacport,* Kotka, 99 rolls newsprint.
Jay Madden Corp., *Mormacport,* Kotka, 1448 rolls newsprint.

## NORFOLK IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

Champagne Paper Corp., *Collamer,* Havre, 420 cs. cigarette paper.
Chase National Bank, *Black Hawk,* Rotterdam, 211 bls. bagging.
Loumar Textile By Products, Inc., *Black Hawk,* Antwerp, 68 bls. bagging.

## NEWPORT NEWS IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

De Manduit Paper Corp., *Collamer,* Havre, 1007 cs. cigarette paper.

## ORANGE IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

———, *Uddeholm,* Kopmanholmen, 6000 bls. dry chemical pulp.

## MONTREAL IMPORTS

WEEK ENDING SEPTEMBER 2, 1939

Pagel Horton & Co., Inc., *Idefjord,* Sweden, 6750 bls. wood pulp.

---

## Process Autoclaves

The Blaw-Knox Company has prepared a catalog (Number 1685) entitled "Process Autoclaves" which describes the manufacture of autoclaves, kettles, cookers, digesters, stills, and other pressure equipment of this nature. Design features and methods of agitation are considered, and there is a complete discussion of the heating systems which may be employed. Typical equipment and installation layouts are visually portrayed by 16 illustrations and diagrams. Some of the processing operations for which Blaw-Knox equipment and plants are offered include: distillation, gas absorption, solvent extraction, solvent recovery, heat transfer, furnacing, kilning and calcining, cracking, polymerizing, evaporation, crystallization, drying, mixing and stirring, organic synthesis, emulsification, high pressure processing, impregnating, and gas cleaning.

---

## Boothby Fibre Can Co. Moved

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 28, 1939—The Boothby Fibre Can Company, formerly of 25 George street, Roxbury, has removed to a more modern factory, previously occupied by the Ground Gripper Shoe Company, at 84 Lind Park street, Roxbury, which the concern has leased for a long term of years. The property, which consists of four buildings of a mill type of construction, with a total floor space of more than 50,000 square feet, is being extensively improved to suit the needs of the Boothby Company.

# LATEST MARKET REVIEW

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, September 6, 1939.

The declaration of war by England and France against Germany has injected a new element into the already confused and complicated business situation both here and in Europe. Although a Democratic administration was shaping the political and economic policy during the World War which began in 1914, the state of industry and trade today is quite different than just prior to the World War. A quarter of a century ago, business was on the decline, while for the past eight months, business activity has been slowly and steadily increasing. Although price advances of at least 25 per cent in a number of consumer products is widely expected by manufacturers, no important change in the price of any grade of pulp, paper or paper board has been announced at this date.

Prices in some lines are very firm and some advances are expected in the near future. While a runaway market is held a possibility, the wide authority now held by President Roosevelt is believed to be adequate to check any undue speculation and to control speculation dangers in most commodities. Industry and trade is now facing a period of uncertainty and while the trade expects a steady increase in demand for practically all forms of paper and paper products, with steadily rising prices, speculation in the form of heavy buying to accumulate large inventories, is cited as a possible danger in several quarters of the trade.

The index of general business activity for the week ended August 26, rose to 92.3 per cent, from 91.5 per cent in the preceding week, compared with 84.6 per cent for the corresponding week last year. Six components forming the index were higher, including paper production, automobile, steel ingot, miscellaneous car loadings and all other car loadings.

Paper production reported by 212 mills was estimated at 80.4 per cent for the week ended August 26, compared with 80.1 per cent for the corresponding period last year. Paper board production for the same period was 72.0 per cent compared with 69.0 per cent for the like period last year.

Increased consumption of newsprint is reported in some quarters of the trade during the past two weeks due to increased newspaper pages and editions issued when the conflict of Germany with Poland began. Too brief a period of time has passed to appraise the probable result of the war on future newsprint consumption. Prices of newsprint remain unchanged at prevailing quotations of $48 to $50 per ton.

Increased demand for some grades of paper has been reported by a number of manufacturers' representatives, jobbers, and general paper merchants this week. One leading manufacturer reports that orders for kraft liners have increased 50% during the past month, and reports from wholesalers indicate an increased demand for kraft wrapping paper. This market is now showing more firmness and the large discounts which have prevailed for some weeks have now been largely discontinued. Higher kraft prices are viewed in the trade as probable, but much kraft wrapping is now being sold at around $3.34 per cwt., less 2 per cent.

Production and sales of some grades of paper board continues at a high level. Prices are firm and no important changes have been reported at this date.

The demand for kraft liner board is very active and while demand is expected to increase and result in higher prices in the future, no change in prevailing quotations has been reported at this date. Production of paper board for the seven months of 1939 totaled 2,575,643 tons, against a rated capacity of 3,867,192 tons. This compares with 2,061,871 tons for the like period in 1938, and with 2,728,888 tons in 1937.

### Mechanical Pulp

Increased demand for mechanical pulp has been reported in some quarters of the trade due to increased production of many grades of ground wood papers.

### Chemical Pulp

The effect of the European war on imported pulp shipments is the cause of considerable uncertainty in the trade. All quotations are temporarily withdrawn.

### Old Rope and Bagging

No important change has been reported this week in the old rope market. Imports of sisal have been steadily declining for some months and imports for the first half of 1939 totaled 50,330 tons, valued at $3,635,774, compared with 54,214 tons, valued at $5,102,611 for the corresponding period last year.

Trading in old bagging shows a little improvement and this market reflects more firmness. Prices continue unchanged at this date.

### Rags

No important change has been reported in demand or prices on any grade of domestic or imported rags this week. France has declared an embargo on the export of all grades of rags. This market is very firm and importers have withdrawn all quotations for the present.

### Old Waste Paper

The old waste paper market is reported as strong, with No. 1 mixed paper and folded news very firm. No price changes have been reported at this date. Old corrugated is less firm under reports of larger supplies in dealer hands.

### Twine

The twine market is reported as more firm, with the trade expecting increased sales volume before long. Prices unchanged on all grades of hard and soft fiber twines.

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, September 6, 1939.

BLANC FIXE—Prices on blanc fixe continue firm and are unchanged at prevailing market levels. The pulp is currently quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder remain firm and conform to prevailing market quotations. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm under an active demand. Standard domestic casein, 20-30 mesh, is currently quoted at from 12½ to 13 cents per pound; 80-100 mesh at 13 to 13½ cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Prices on caustic soda continue firm and unchanged at prevailing market levels. Solid caustic soda is currently quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay continue firm and remain unchanged at prevailing market levels. Domestic filler clay is quoted at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is offered at from $13 to $25 per ton, ship side.

CHLORINE—Prices on chlorine continue firm and conform to prevailing market levels. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm and prices on some grades are reported a little lower for this week. "G" gum rosin is currently quoted at $4.50; "FF" wood rosin at $4.30, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is offered at $2.60 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake continue firm and unchanged at prevailing market prices. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash continue firm and unchanged at prevailing market levels. Prices on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn market is reported as very firm with prices on corn starch higher this week. Globe pearl is currently quoted at $2.55 per 100 pounds; special paper starch at $2.65 per 100 pounds. All prices in bags, car lot quantities, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm and unchanged at prevailing market levels. The commercial grades are quoted at $1.15; iron free at $1.30 per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Prices on sulphur continue firm and unchanged at prevailing market quotations. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market levels. Domestic talc is currently offered at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $20 to $40 per ton, on dock.

# Market Quotations

## Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| **News, per ton—** | | | |
| Roll, contract | $50.00 | @ | — |
| Sheets | 58.00 | @ | — |
| **Kraft—per cwt.—Delivered Zone A** | | | |
| No. 1 Northern | $4.75 | @ | $5.25 |
| Superstandard | 4.12½ | @ | 4.62½ |
| Northern Standard Wrapping | 4.00 | @ | — |
| Standard Wrapping | 3.50 | @ | — |
| **Tissues—Per Ream—Carlots** | | | |
| White No. 1 | $0.82½ | @ | — |
| White No. 1 M. G. | .80 | @ | — |
| White No. 1½ | .67½ | @ | — |
| White No. 2 | .60 | @ | — |
| Anti-Tarnish M. G. | .65 | @ | — |
| Colored | .77½ | @ | — |
| Kraft | .65 | @ | — |
| Manila | .60 | @ | — |
| Unbl. Toilet, 1 M. | 2.65 | @ | — |
| Bleached Toilet | 5.26 | @ | — |
| **Paper Towels—Per Case** | | | |
| Unbleached, Jr. | $1.75 | @ | — |
| Bleached Jr. | 3.10 | @ | — |
| **Manila—per cwt.—C. l. f. a.** | | | |
| No. 1 Jute | 7.75 | @ | 9.75 |
| No. 1 Manila Wrapping, 35 lb. | 5.00 | @ | — |
| No. 2 Manila Wrapping, 35 lb. | 4.75 | @ | — |
| **Boards, per ton—** | | | |
| News | 32.50 | @ | 35.00 |
| Chip | 32.50 | @ | 35.00 |
| Sgl. Mla. Lt. Chip | 42.50 | @ | — |
| Jute Lined Chip | 42.50 | @ | 45.00 |
| White Pat. Coated | 55.00 | @ | 57.50 |
| Kraft Liners | 45.00 | @ | — |
| Binders Boards | 71.00 | @ | 77.00 |

The following are representative of distributors' resale prices:

**Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| 100% Rag Ext. No. 1 | $39.10 | @ $46.00 | $40.25 | @ $47.25 |
| 100% Rag | 31.05 | @ 36.50 | 32.20 | @ 37.75 |
| 85% Rag | ..... | | 29.90 | @ 35.00 |
| 75% Rag | 23.60 | @ 27.75 | 24.75 | @ 29.00 |
| 65% Rag | ..... | | 21.65 | @ 26.25 |
| 50% Rag | 17.55 | @ 21.50 | 18.70 | @ 22.75 |
| 25% Rag | 14.65 | @ 17.75 | 15.80 | @ 19.25 |

Colors at $1.00 cwt. extra.

**Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| No. 1 | $8.60 | @ $10.50 | $9.75 | @ $12.00 |
| No. 2 | 7.70 | @ 9.50 | 8.90 | @ 10.75 |
| No. 3 | 6.75 | @ 8.25 | 7.90 | @ 10.00 |
| No. 4 | 7.00 | @ 8.50 | 8.20 | @ 10.00 |

Colors $1.00 cwt. extra.

**Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:**

| | | | |
|---|---|---|---|
| No. 1 Glossy Coated | $11.30 | @ | $12.75 |
| No. 2 Glossy Coated | 9.70 | @ | 11.00 |
| No. 3 Glossy Coated | 8.60 | @ | 10.00 |
| No. 4 Glossy Coated | 8.05 | @ | 9.25 |
| No. 1 Antique (watermarked) | 8.05 | @ | 9.25 |
| No. 2 Offset | 7.45 | @ | 8.50 |
| A Grade E. F. | 7.20 | @ | 8.25 |
| A Grade S. & S. C. | 7.45 | @ | 8.50 |
| B Grade E. F. | 6.65 | @ | 7.75 |
| B Grade S. & S. C. | 6.90 | @ | 8.00 |
| C Grade E. F. | 6.40 | @ | 7.50 |
| C Grade S. & S. C. | 6.65 | @ | 7.75 |
| D Grade E. F. | 6.10 | @ | 7.00 |
| D Grade S. & S. C. | 6.35 | @ | 7.25 |

Ivory & India at $.50 cwt. extra.

## Mechanical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| No. 1 Imported— | | | |
| Moist | 22.50 | @ | 24.00 |
| Dry | 22.50 | @ | 24.00 |
| (Delivered) | | | |
| No. 1 Domestic and Canadian | 29.00 | @ | 33.00 |

## Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

| | | | |
|---|---|---|---|
| **Bleached Sulphite (Domestic and Foreign)—** | | | |
| Prime Bleached Sulphite | *2.25 | @ | *2.75 |
| **Prime Qualities—** | | | |
| Easy-Bleaching Sulphite | *1.90 | @ | *2.00 |
| Strong Unbleached Sulphite | *1.70 | @ | $2.00 |
| (On Dock, Atlantic Ports) | | | |
| Kraft Bleached | *2.50 | @ | *2.75 |
| Kraft Light & Strong | *1.50 | @ | *1.60 |
| Kraft No. 1 | *1.40 | @ | *1.50 |
| Kraft No. 2 | *1.25 | @ | *1.30 |
| (F. o. b. Pulp Mill) | | | |
| Kraft Domestic | *1.25 | @ | *1.75 |
| (Delivered) | | | |
| Soda Bleached | *2.55 | @ | — |

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

* All quotations temporarily withdrawn.

## Domestic Rags

**New Rags**

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| **Shirt Cuttings—** | | | |
| New White, No. 1 | 6.90 | @ | 7.00 |
| Silesias No. 1 | 4.50 | @ | 4.75 |
| New Unbleached | 6.75 | @ | 7.00 |
| Blue Overall | 4.90 | @ | 5.00 |
| Fancy | 1.75 | @ | 2.00 |
| Washables | 1.50 | @ | 1.60 |
| Mixed Khaki Cuttings | 2.25 | @ | 2.50 |
| O. D. Khaki Cuttings | 3.25 | @ | 3.40 |

**Old Rags**

| | | | |
|---|---|---|---|
| **White, No. 1—** | | | |
| Repacked | 2.90 | @ | 3.15 |
| Miscellaneous | 2.10 | @ | 2.25 |
| **White, No. 2—** | | | |
| Repacked | 1.50 | @ | 1.60 |
| Miscellaneous | 1.25 | @ | 1.40 |
| **Thirds and Blues—** | | | |
| Repacked | 1.30 | @ | 1.40 |
| Miscellaneous | 1.15 | @ | 1.20 |
| **Roofing Rags—** | | | |
| No. 1 | .90 | | 1.00 |
| No. 2 | .67½ | @ | .77½ |
| No. 3 (bagging) | .55 | @ | .65 |
| No. 4 | .60 | @ | .65 |
| No. 5A | .60 | @ | .65 |

## Foreign Rags

**New Rags**

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | @ | 2.20 |
| New Light Silesias | 5.50 | @ | 5.75 |
| Light Flannelettes | 5.50 | @ | 5.75 |
| New White Cuttings | 7.00 | @ | 7.50 |
| New Light Oxford | 4.00 | @ | 4.50 |
| New Light Prints | 3.00 | @ | 3.25 |

**Old Rags**

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | @ | 8.50 |
| No. 2 White Linens | 6.50 | @ | 7.50 |
| No. 3 White Linens | 4.50 | @ | — |

# HIGHEST QUALITY CLAYS

LUMP and POWDERED } IMPORTED

DOMESTIC { CRUDE CRUSHED, AIR FLOATED, WATER WASHED

PRECIPITATED CALCIUM CARBONATE

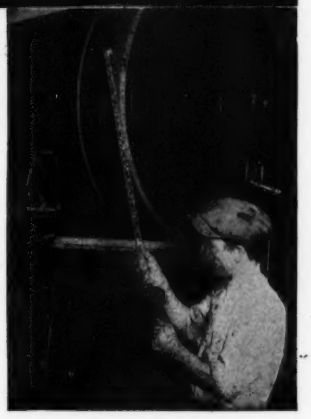
temperature

*affects*

SIZING— FINISH— STRENGTH

of the

*FINISHED SHEET . . .*



Every paper man knows this. Water logged rolls that are too cold, with adjacent rolls overheated, were a serious problem before the more progressive mills pointed out the solution . . . the checking of individual roll surface temperatures with a Cambridge Surface Pyrometer. This quick, rugged, easy-reading instrument is made in the hand model for close-up work and with an extension for reaching otherwise inaccessible rolls. Send for descriptive literature.

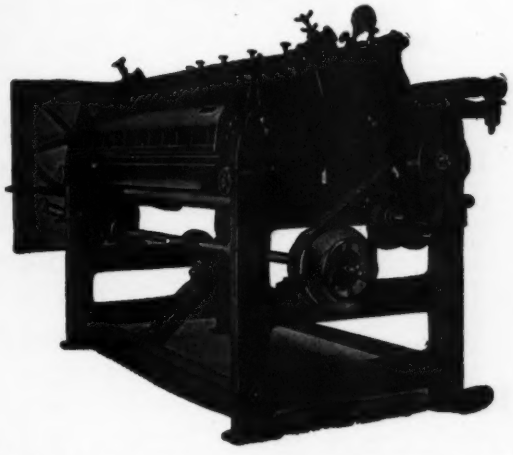
CAMBRIDGE INSTRUMENT CO., Inc.
3732 Grand Central Terminal, New York City

**CAMBRIDGE**
SURFACE PYROMETERS

*Send for details of these instruments. They will help save money and make better paper.*

MODEL 28

**ROLLER BEARING CUTTER**



**HAMBLET MACHINE CO.**
LAWRENCE, MASS.

MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS.
CUTTER KNIVES. PATENT TOP SLITTERS.

**WATERBURY FELTS**

*Are Made By*

H. WATERBURY & SONS CO.
ORISKANY, NEW YORK

**CLINTON STARCHES**

*Special Grades for Beater and Top Sizing*

Manufactured by
CLINTON COMPANY
CLINTON, IOWA

QUALITY SERVICE

| | | | |
|---|---|---|---|
| No. 4 White Linens. | 2.25 | @ | 3.25 |
| No. 1 White Cotton. | 4.25 | @ | 4.75 |
| No. 2 White Cotton. | 3.25 | @ | 3.75 |
| No. 3 White Cotton. | 2.50 | @ | 3.00 |
| No. 4 White Cotton. | 1.90 | @ | 2.20 |
| Extra Light Prints.. | 2.00 | @ | 2.40 |
| Ord. Light Prints... | 1.75 | @ | 2.15 |
| Med. Light Prints.... | 1.55 | @ | 1.95 |
| Dutch Blue Cottons. | 2.25 | @ | 2.50 |
| French Blue Linens.. | 3.00 | @ | — |
| Checks and Blues... | 2.00 | @ | — |
| Linsey Garments.... | 1.90 | @ | 2.00 |
| Dark Cottons..... | 1.50 | @ | 1.60 |
| Old Shopperies..... | 1.30 | @ | 1.45 |
| New Shopperies..... | 1.45 | @ | 1.50 |
| French Blues..... | 2.25 | @ | 2.50 |

### Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign ..... | 1.60 | @ | 1.75 |
| Domestic ..... | 1.50 | @ | 1.60 |
| Wool Tares, light... | 1.60 | @ | 1.70 |
| Wool Tares, heavy.. | 1.80 | @ | 1.90 |
| Bright Bagging..... | 1.50 | @ | 1.60 |
| Manila Rope— | | | |
| Foreign .....2.60 | | @ | 2.75 |
| Domestic ..... | 2.75 | @ | 3.00 |
| Jute Threads..... | 3.00 | @ | 3.25 |
| Sisal Strings ..... | 1.50 | @ | 1.60 |
| Mixed Strings.... | .55 | @ | .60 |

### Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings ..... | 2.30 | @ | 2.40 |
| Ordinary Hard White No. 1.... | 1.90 | @ | 2.00 |
| Soft White No. 1.. | 1.60 | @ | 1.75 |
| Soft White Extra.. | 2.25 | @ | 2.40 |
| Flat Stock— | | | |
| Stitchless ..... | .80 | @ | .85 |
| Overissue Mag ... | .70 | @ | .75 |
| Solid Flat Book... | .60 | @ | .65 |
| Crumbled No. 1.... | .40 | @ | .45 |
| Ledger Stock White. | 1.05 | @ | 1.15 |
| Ledger Stock Colored | .60 | @ | .70 |
| Manila— | | | |
| New Env. Cut.... | 1.40 | @ | 1.50 |
| New Cuttings..... | 1.00 | @ | 1.20 |
| Old Kraft Machine— | | | |
| Compressed bales.. | .75 | @ | .80 |
| News— | | | |
| No. 1 White News | 1.25 | @ | 1.30 |
| Strictly Overissue. | .40 | @ | .45 |
| Strictly Folded.... | .37½ | @ | .40 |
| Corrugated ..... | .45 | @ | .47½ |
| No. 1 Mixed Paper.. | .32½ | @ | .35 |

### Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India ..... | .12¾ | @ | .14¾ |
| White Hemp..... | .13¾ | @ | .15¾ |
| Fine Polished— | | | |
| Fine India..... | .16 | @ | .18 |
| Unpolished— | | | |
| Box ..... | .09½ | @ | — |
| Paper Makers..... | .09½ | @ | .10½ |
| Tube Rope..... | .10¾ | @ | .12½ |
| Wall Paper..... | .10¾ | @ | .12½ |
| Wrapping ..... | .12 | @ | — |
| Soft Fiber Rope... | .12 | @ | .14 |
| Cotton ..... | .16 | @ | .19 |
| (Hard Fiber) | | | |
| Medium Java..... | .11 | lb | .17 |
| Mex. Sisal..... | .10 | @ | .16 |
| Manila ..... | .16 | @ | .23 |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | .06 | @ | .06½ |
| New White, No. 2. | .03½ | @ | .04 |
| Light Silesias..... | .03½ | @ | .04 |
| Silesias, No. 1.... | — | @ | .04½ |
| Black Silesias, soft | .03 | @ | .03¾ |
| New Unbleached.. | .05½ | @ | .06 |
| Washable, No. 1.. | .01½ | @ | .01¾ |
| Blue Overall..... | .04 | @ | .04½ |
| Cottons—According to grades— | | | |
| Washable No. 2.... | .01 | @ | .01¾ |
| New Blue..... | .01 | @ | .01¾ |
| Fancy Percales... | — | @ | .02½ |
| New Black Soft... | .03 | @ | .03½ |
| New Light Seconds | — | @ | .04½ |
| New Dark Seconds | .50 | @ | .75 |
| Khaki Cuttings— | | | |
| No. 1 O. D..... | .03 | @ | .03½ |
| No. 2 Mixed..... | .02½ | @ | .02¾ |
| Corduroy ..... | — | @ | .02 |
| New Canvas..... | .05 | @ | .05½ |
| New Black Mixed. | .02½ | @ | .02¾ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked ..... | 2.75 | @ | 3.00 |
| Miscellaneous .... | 2.00 | @ | 2.25 |
| Thirds and Blues— | | | |
| Miscellaneous .... | 1.00 | @ | 1.25 |
| Repacked ..... | 1.50 | @ | 1.75 |
| Black Stockings (Export) ..... | 3.00 | @ | 3.50 |
| Roofing Stock— | | | |
| Foreign No. 1..... | .90 | @ | 1.10 |
| Domestic No. 1... | .80 | @ | .90 |
| Domestic No. 2... | .60 | @ | .65 |
| Roofing Bagging... | .40 | @ | .45 |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign ..... | — | @ | 1.50 |
| Domestic ..... | 1.50 | @ | 1.60 |
| Manila Rope..... | — | @ | 3.25 |
| Sisal Rope..... | 1.50 | @ | 1.75 |
| Mixed Rope..... | .75 | @ | 1.00 |
| Scrap— | | | |
| No. 1..... | — | @ | 1.50 |
| No. 2..... | .80 | @ | .90 |
| Wool Tares, heavy.. | 3.25 | @ | 3.50 |
| Mixed Strings..... | .45 | @ | .50 |
| No. 1 New Light Burlap ..... | 2.50 | @ | 3.00 |
| New Burlap Cuttings | 1.75 | @ | 2.00 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.30 |
| No. 2 Hard White | 1.90 | @ | 2.00 |
| No. 1 Soft White. | 1.75 | @ | 1.80 |
| No. 2 Soft White. | 1.40 | @ | 1.50 |
| No. 1 Mixed..... | .65 | @ | .75 |
| Solid Ledger Stock.. | 1.45 | @ | 1.50 |
| Ledger Stock, white. | 1.10 | @ | 1.15 |
| Ledger Stock, colored | .75 | @ | .80 |
| No. 1 Books, heavy.. | .60 | @ | .65 |
| Manila Cuttings.... | 1.45 | @ | 1.50 |
| Print Manila..... | .45 | @ | .50 |
| Container Manila.... | .42½ | @ | .47½ |
| Kraft Paper..... | .65 | @ | .70 |
| No. 1 Mixed Paper.. | .37½ | @ | .40 |
| Straw Board Chip... | .25 | @ | .30 |
| Binders Board Chip. | .30 | @ | .35 |
| Corrugated Board... | .50 | @ | .55 |
| Overissue News..... | .45 | @ | .50 |
| Old Newspapers..... | .35 | @ | .40 |

## BOSTON

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.50 |
| No. 1 Soft White. | 1.85 | @ | 2.15 |
| No. 2 Mixed..... | .75 | @ | .80 |
| Solid Ledger Books.. | 1.30 | @ | — |
| Overissue Ledger Stock ..... | 1.30 | @ | 1.50 |
| Mixed Ledgers..... | .85 | @ | .90 |
| No. 1 Books, heavy.. | .70 | @ | — |
| No. 1 Books, light.. | .65 | @ | .75 |
| Crumpled Stitchless Book Stock..... | .55 | @ | .65 |
| Manila Env. Cuttings | 1.70 | @ | 1.85 |
| Manila Envelope Cuttings, Extra Quality | 2.00 | @ | 2.10 |
| No. 1 Old Manila... | .65 | @ | .70 |
| White Blank News.. | 1.30 | @ | 1.40 |
| No. 1 Kraft..... | .70 | @ | .75 |
| Mixed Papers..... | .22½ | @ | .25 |
| Print Manila ..... | .45 | @ | .55 |
| Container Manila.... | .32½ | @ | .35 |
| Old Newspapers..... | .32½ | @ | .35 |
| Paper Wool Strings.. | .60 | @ | .65 |
| Overissue News..... | .45 | @ | .50 |
| Box Board Chips.... | .25 | @ | .30 |
| Corrugated Boxes... | .32½ | @ | .35 |
| Kraft corrugated boxes | .65 | @ | .75 |
| Screening Wrappers. | .40 | @ | .45 |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign ..... | 2.50 | @ | 2.65 |
| Domestic ..... | 2.65 | @ | 2.75 |
| Sisal Rope ..... | 1.75 | @ | 1.85 |
| Mixed Rope..... | .45 | @ | .50 |
| Transmission Rope.. | 1.80 | @ | 1.90 |
| Soft Jute Rope ..... | 2.00 | @ | 2.25 |
| Jute Carpet Threads. | .75 | @ | .90 |
| Gunny Bagging— | | | |
| Foreign ..... | 1.50 | @ | 1.65 |
| Domestic ..... | 1.35 | @ | 1.40 |
| Bleachery Burlap.... | 2.50 | @ | 2.70 |
| Scrap Burlap— | | | |
| Foreign ..... | 1.35 | @ | 1.40 |
| Domestic ..... | 1.25 | @ | 1.40 |
| Scrap Sisal..... | 1.55 | @ | 1.60 |
| Scrap Sisal for Shredding ..... | 1.75 | @ | 1.80 |
| Wool Tares, Heavy.. | 1.40 | @ | 1.50 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |
| Aust. Wool Pouches. | 2.00 | @ | 2.10 |
| Heavy Baling Bagging | 1.50 | @ | 1.60 |
| Paper Mill Bagging.. | .85 | @ | 1.00 |
| No. 2 Bagging..... | .45 | @ | .50 |

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints... | .03¼ | @ | .03½ |
| New White No. 1.... | .0675 | @ | .0690 |
| New Light Flannelettes ..... | .05 | @ | — |
| Silesias No. 1..... | .04 | @ | .04¼ |
| New Black Silesias.. | .03½ | @ | .03¾ |
| Soft Unbleached..... | 6.50 | @ | 7.00 |
| Blue Cheviots ..... | .05 | @ | .05½ |
| Fancy ..... | .02 | @ | .02½ |
| Washable ..... | .02 | @ | .02½ |
| Cottons—According to grades— | | | |
| Blue Overalls..... | .04¼ | @ | .05 |
| New Black, soft... | .03¼ | @ | .04 |
| Khaki Cuttings..... | .02½ | @ | .03 |
| O. D. Khaki..... | .03 | @ | .03½ |
| Corduroy ..... | .02¼ | @ | .03 |
| New Canvas..... | .06¼ | @ | .07½ |
| B. V. D. Cuttings... | .06¼ | @ | .07 |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas ..... | .04¼ | @ | — |
| White No. 1— | | | |
| Repacked ..... | — | @ | 2.75 |
| Miscellaneous ..... | 2.50 | @ | 2.75 |
| White No. 2— | | | |
| Repacked ..... | 1.90 | @ | 2.00 |
| Miscellaneous ..... | 2.00 | @ | 2.25 |
| Twos and Blues..... | 1.75 | @ | 2.00 |
| Old Blue Overalls... | 1.50 | @ | — |
| Thirds and Blues— | | | |
| Repacked ..... | 1.37½ | @ | 1.75 |
| Miscellaneous ..... | 1.25 | @ | 1.62½ |
| Black Stockings..... | 3.90 | @ | 4.00 |
| Roofing Stock— | | | |
| No. 1..... | 1.00 | @ | 1.10 |
| No. 2..... | .65 | @ | .70 |
| No. 3..... | .45 | @ | .50 |

### Foreign Rags

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons..... | .90 | @ | 1.00 |
| Dutch Blues..... | 2.65 | @ | 2.75 |
| New Checks and Blues | 2.85 | @ | 3.00 |
| Old Fustians..... | 2.25 | @ | 2.50 |
| Old Linsey Garments. | 2.10 | @ | 2.25 |
| New Silesias..... | 3.75 | @ | 4.00 |

## CHICAGO

### Old Papers

(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 White Envelope Cuttings.... | 1.80 | @ | 1.90 |
| No. 1 Hard White. | 1.70 | @ | 1.80 |
| No. 1 Soft White.. | 1.50 | @ | — |
| Ledger & Writings.. | .75 | @ | .80 |
| Solid Books..... | .45 | @ | .50 |
| Blanks ..... | .90 | @ | — |
| Krafts ..... | .45 | @ | .50 |
| New Kraft Cuts..... | 1.10 | @ | — |
| Manila Env. Cuts... | Nominal | | |
| Ex. No. 1 Manila... | Nominal | | |
| Print Manila ..... | Nominal | | |
| Overissue News..... | .35 | @ | — |
| Old Newspapers— | | | |
| No. 1 Folded News | .25 | @ | .30 |
| No. 1 Mixed Paper | .15 | @ | .20 |
| Roofing Stocks— | | | |
| No. 1..... | 1.00 | @ | 1.05 |
| No. 2..... | .85 | @ | — |

## TORONTO

### Paper

### Bonds

Direct mill shipment in two-ton lots

| | | | |
|---|---|---|---|
| No. 1 White .....$35.50 | | @ | — |
| No. 1 Tints ..... | 36.50 | @ | — |
| No. 2 White ..... | 25.50 | @ | — |
| No. 2 Tints ..... | 26.50 | @ | — |
| No. 2 Golden Rod.. | 27.50 | @ | — |
| No. 3 White ..... | 21.00 | @ | — |
| No. 4 White ..... | 15.00 | @ | — |
| No. 4 Tints ..... | 16.00 | @ | — |
| No. 4 Golden Rod... | 17.00 | @ | — |
| Direct mill shipment in three-ton lots | | | |
| No. 5 White .....$10.50 | | @ | — |
| No. 5 Tints ..... | 11.50 | @ | — |
| No. 5 Golden Rod.. | 12.00 | @ | — |
| No. 6 White ..... | 9.00 | @ | — |
| No. 6 Tints ..... | 9.50 | @ | — |
| No. 6 Golden Rod.. | 11.00 | @ | — |
| No. 7 White ..... | 8.00 | @ | — |
| No. 7 Tints ..... | 8.50 | @ | — |
| No. 7 Golden Rod.. | 10.00 | @ | — |
| Book— | | | |
| No. 1 M. F. ..... | $7.00 | @ | — |
| No. 2 M. F. ..... | 6.50 | @ | — |
| No. 3 M. F. ..... | 5.35 | @ | — |
| No. 1 S. C. ..... | 7.25 | @ | — |
| No. 2 S. C. ..... | 6.75 | @ | — |
| No. 3 S. C. ..... | 5.85 | @ | — |

### Coated Book & Litho

Ton Lots (resale)

| | | | |
|---|---|---|---|
| No. 1 .....$12.00 | | @ | — |
| No. 2 ..... | 10.25 | @ | — |
| No. 3 ..... | 8.90 | @ | — |
| Coated tinted ..... | 13.00 | @ | — |
| Wrapping—delivered— | | | |
| Rag Brown..... | 4.85 | @ | 5.25 |
| White Wrap..... | 4.00 | @ | — |
| "B" Manila..... | 4.90 | @ | 6.15 |
| No. 1 Manila..... | 5.50 | @ | 6.90 |
| Fiber ..... | 5.50 | @ | 6.90 |
| Kraft No. 2..... | 5.50 | @ | 6.90 |

(F. o. b. Cars, Toronto)

| | | | |
|---|---|---|---|
| News per ton— | | | |
| Rolls (contract)..)46.00 | | @ | — |
| Sheets .....54.00 | | @ | — |

### Pulp

| | | | |
|---|---|---|---|
| Ground wood.....$29.00 | | @ | — |
| Unbleached sulphite. | 44.00 | @ | — |
| Bleached sulphite... | 54.00 | @ | — |
| Kraft ..... | 50.00 | @ | — |
| Soda ..... | 54.00 | @ | — |

### Old Waste Paper

(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut... | 2.00 | @ | — |
| Soft White..... | 1.75 | @ | — |
| White Blk. News.. | 1.25 | @ | 1.10 |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | .70 | @ | — |
| Light and Crumpled Book Stock. | .60 | @ | — |
| Ledgers and Writings ..... | 1.00 | @ | — |
| Manilas— | | | |
| New Manila Cut... | 1.35 | @ | — |
| Printed Manilas... | .45 | @ | — |
| Kraft ..... | .95 | @ | — |
| News and Scrap— | | | |
| Strictly Overissue.. | .50 | @ | — |
| Strictly Folded.... | .45 | @ | — |
| No. 1 Mixed Paper.. | .30 | @ | — |

### Domestic Rags

(Price to Mills, f.o.b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings ..... | .06½ | @ | .06¾ |
| Light Prints..... | .03 | @ | .03½ |